COMPAQ

ProLiant 1850R Servers

Maintenance and Service Guide

Notice

The information in this publication is subject to change without notice.

Compaq ProLiant 1850R Servers Maintenance and Service Guide

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About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing ProLiant 1850R Servers.

> ⚠ **WARNING:** To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

> **IMPORTANT:** The installation of options and servicing of this product should be performed by individuals that are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

> ⚠ **WARNING:** Indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

> ⚠ **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or loss of information.

> **IMPORTANT:** Presents clarifying information or specific instructions.

NOTE: Presents commentary, sidelights, or interesting points of information.

Compaq Technician Notes

> ⚠ **WARNING:** Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.

> ⚠ **WARNING:** To reduce the risk of personal injury from electrical shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that

are hazardous.

⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:

- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.

- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

⚠ **CAUTION:** To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

⚠ **CAUTION:** The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

⚠ **CAUTION:** To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

IMPORTANT: Any indication of repair at the component level or modification of a printed wiring board may void any warranty.

Where to Go for Additional Help

Major sources of additional information are listed below

Other Information Sources

In addition to this guide, the following information sources are available:

- User Documentation

- *Compaq Service Quick Reference Guide*

- Service Training Guides

- Compaq Service Advisories and Bulletins

- Compaq QuickFind

- Compaq Insight Manager

- Compaq Download Facility: Call 1-281-518-1418

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

In the United States, call 1-800-345-1518
In Canada, call 1-800-263-5868

For Compaq technical support:
In the United States and Canada, call 1-800-386-2172
For Compaq technical support phone numbers outside the United States and Canada, visit the
Compaq Website at: http://www.compaq.com

Elsewhere, call one of the numbers listed in the following table:

Compaq Worldwide Technical Support Telephone Numbers					
Location	**Telephone Number**		**Location**	**Telephone Number**	
	Voice	**Fax**		**Voice**	**Fax**
Argentina	541- 796-8100	54-1 313 3100 Ext 21	Distribution Center Europe	+31-183-96400	+31-183-620488
Australia	+61-2-9911-1999	61-2-9911-1800	Ecuador	+011-59-3-225-4343	+011-59-3-225-4342
Austria	+431-87816-0	+431-878-16-80	Finland	+358-0-615-599	+358-0-6155-9898
Belgium	+322-716-9511	+322-725-2213	France	+33 1-4133-4100	+33 1-4133-4400
Brazil	+55-11 246-7866	+55-11524-8050	Germany *	+49-89-9933-0	+49-89-9933-1158
Canada	905-707-1715	416-229-8898	Hungary	+36-1-201-8776	+36-1-201-9696
* NOTE: Eastern Europe and the Middle East are also supported from Germany					
Caribbean	281-518-2206	281-518-8166	India	+91-80-559-6023	+91-80-559-6025
Central America	281-378-2206	281-518-8166	Italy	+39-2-5759-01	+39-2-824-2015
Chile	+562-200-8100	+562-200-0540	Japan	+3-5402-5700	+3-5402-5964
China	+86-10-849-2928	+86-10-849-6726	Korea	+82-2-3470-0766	+82-2-523-3576
Colombia	+571-312-0147	+571-312-0164	Malaysia	+603-7541122	+603-7548600
Czech Republic	+422-232-8772	+422-232-8773	Mexico	+525-229-7900	+525-229-7959
Denmark	+45-4590-4590	+45-4590-4595	Netherlands	+31-182-565888	+31-182-538348

continued

Compaq Worldwide Technical Support Telephone Numbers *continued*

Location	Telephone Number		Location	Telephone Number	
	Voice	**Fax**		**Voice**	**Fax**
New Zealand	+64-9-307-3143 Ext 817	+64-9-309-9198	Spain	+341-640-1500	+341-640-0064
Norway	+47-2207-2000	+47-2207-2001	South Africa	+27-11-728-6999	+27-11-728-3335
Poland	+48-22-630-3535	+48-22-630-3553	Sweden	+468-703-5200	+468-751-2057
Portugal	+3511-412-8400	+3511-412-0654	Switzerland	+41-1838-2111	+41-1836-7107
Puerto Rico	809-765-4360	809-765-4336	Taiwan	886-2-735-1000	886-2-732-2660
Russia	+7095-9671700	+7095-9671701	Thailand	+66-2-679-6222	+66-2-679-6220
Scotland	+44-141-814-8000	+44-141-812-7745	United Kingdom	+44-1-41-270-4000	+44-1-41-270-4100
Singapore APD Asia/Pacific	+65-336-3333	+65-750-4627	United States	281-370-0670	281-514-1740
Compaq Asia	+65-750-4319	+65-752-7385			
			Venezuela	+582-953-8844	+582-952-7393

Chapter 1
Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spare parts list for the ProLiant 1850R Servers. See Table 1-1 for the names of referenced spare parts.

Mechanical Parts Exploded View
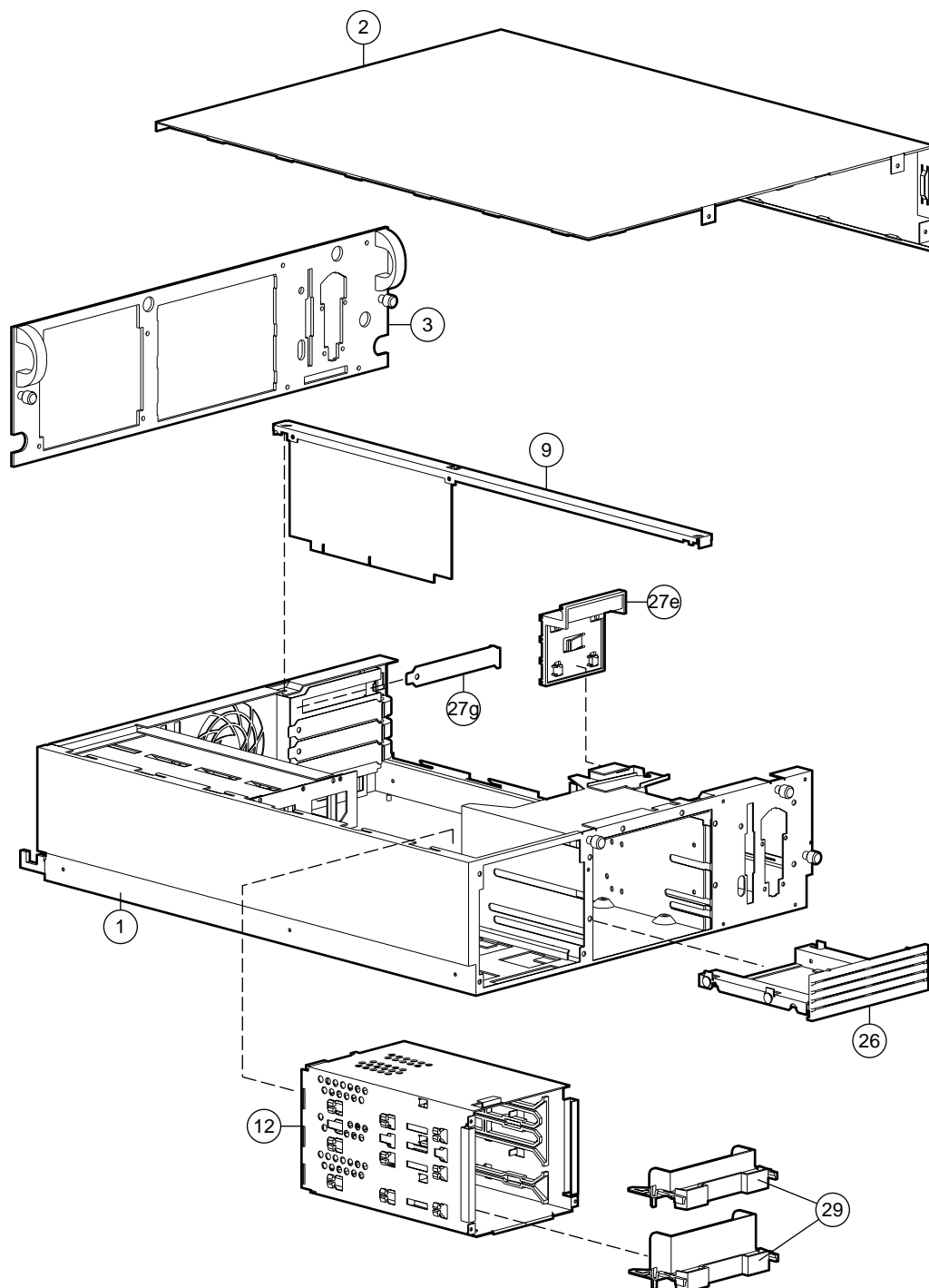
Figure 1-1. Mechanical parts exploded view of the ProLiant 1850R server

System Components
Exploded View
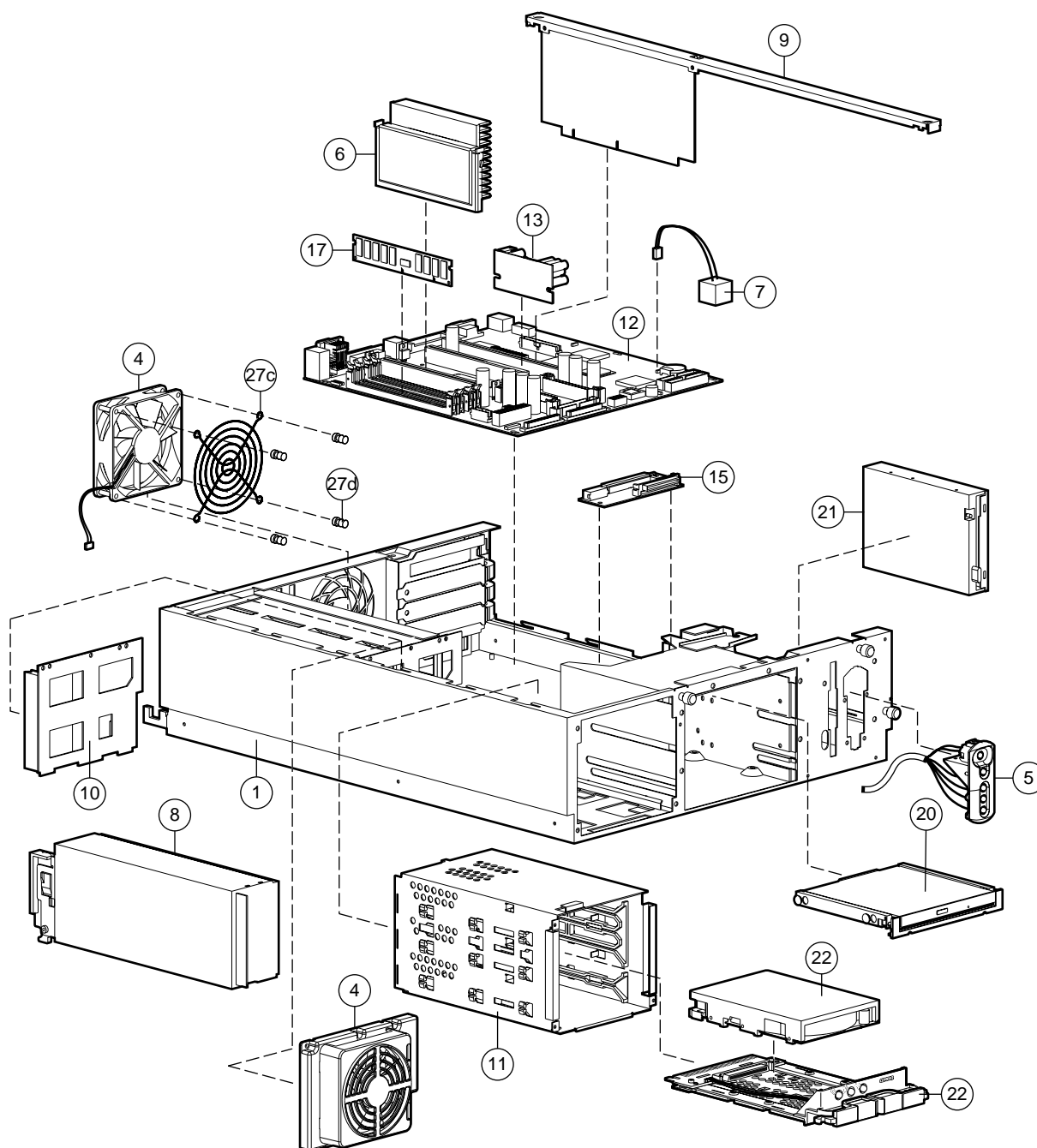
Figure 1-2. System components exploded view of the ProLiant 1850R server

Spare Parts List

**Table 1-1
Spare Parts List**

Ref.	Description	Spare Part #
CHASSIS		
1	Chassis	327309-001
2	Server Cover	327313-001
3	Rack-Mount Bezel	327311-001
SYSTEM COMPONENTS		
4	Fan	173907-001
5	Power/Standby Switch with Cable and LEDs	327312-001
6	Intel Pentium II 400 Processor	313624-001
7	External Replacement Battery	160274-001
8	Hot-Plug Redundant Power Supply	283623-001
	BOARDS	
9	Riser Board with Brace	333109-001
10	Power Supply Backplane Board	333112-001
11	SCSI Backplane Board with Drive Cage	333111-001
12	System I/O Board without Processor	333110-001
13	Power Processor Module	327660-001
14	Remote Insight Board (NA Modem)	294040-001 *
15	CD-ROM Adapter Board	167208-001
	MEMORY	
16	32-MB SDRAM DIMM Memory Module	317747-001 *
17	64-MB SDRAM DIMM Memory Module	317745-001
18	128-MB SDRAM DIMM Memory Module	317756-001 *
19	256-MB SDRAM DIMM Memory Module	317749-001 *

continued

Spare Parts List - ProLiant 1850R Servers *continued*

Item	Description	Spare Part #
	MASS STORAGE DEVICES	
20	24X Max IDE Low Profile CD-ROM	327921-001
21	1.44-MB, 3.5-inch Diskette Drive (3-mode)	288456-001
22	4.3-GB Pluggable Wide-Ultra SCSI-3 Drive	295680-B21
	CABLE ASSEMBLIES	
23	Miscellaneous Power Cable Kit a) 14-Pin Signal Power Cable Assembly b) 20-Pin Main Power Cable Assembly	327919-001 *
24	Miscellaneous Signal Cable Kit a) 28 inch F1, Point-to-Point SCSI Cable Assembly b) Two Device, F1, SCSI Cable Assembly c) Diskette Drive Cable Assembly d) Eight Inch, F1, CD Data Cable Assembly	327920-001 *
	MISCELLANEOUS	
25	CD Mount Tray Assembly	327318-001 *
26	Removable Media Tray	
27	Miscellaneous Plastics Kit a) Fan Guard Power Supply * b) Fan Cover * c) Wireform Fan Guard d) Push-Lock Fastener e) Processor Retention Brackets * f) Fan Mounting Bracket * g) Slot Cover e) Card Guide	327319-001 *
28	Rack-mounting Kit	327310-001 *
29	Hot-Plug Cover	296200-001
30	Return Kit	327322-001 *
31	Cartons and Buns, International	327322-002 *
32	Illustrated Parts Map	327320-001 *
33	Maintenance and Service Guide	327321-001 *

Spare Parts List - ProLiant 1850R Servers *continued*

Item	Description	Spare Part #
	KEYBOARDS	
34	Keyboard, U.S. English	160648-101 *
35	Keyboard, U.K. English	160648-103 *
36	Keyboard, German	160648-104 *
37	Keyboard, French	160648-105 *
38	Keyboard, Italian	160648-106 *
39	Keyboard, Spanish	160648-107 *
40	Keyboard, Danish	160648-108 *
41	Keyboard, Norwegian	160648-109 *
42	Keyboard, Swedish/Finnish	160648-110 *
43	Keyboard, Swiss	160648-111 *
44	Keyboard, French Canadian	160648-112 *
45	Keyboard, Portuguese	160648-113 *
46	Keyboard, Turkish	160648-114 *
47	Keyboard, Greek	160648-115 *
48	Keyboard, Latin American	160648-116 *
49	Keyboard, Arabic	160648-117 *
50	Keyboard, Belgian	160648-118 *
51	Keyboard, BHCSY	160648-120 *
52	Keyboard, Hungarian	160648-121 *
53	Keyboard, Polish	160648-122 *
54	Keyboard, Slovakian	160648-123 *
55	Keyboard, Russian	160648-124 *
56	Keyboard, Czech	160648-129 *

Spare Parts List - ProLiant 1850R Servers *continued*

Item	Description	Spare Part #
OPTIONS		
57	Compaq Netelligent 56K Fax Modem	294912-001 *
58	12/24-GB DAT Drive	340593-001 *
59	Pentium II 350 Processor	313623-001 *
	FIXED DISK DRIVES	
60	4.3-GB Pluggable Wide-Ultra SCSI-3, 10,000 rpm Drive	336680-001 *
61	9.1-GB Pluggable Wide-Ultra SCSI-3, 10,000 rpm Drive	336381-001 *
62	9.1-GB Pluggable Wide-Ultra SCSI-3 Drive	313715-001 *
63	18.2-GB Pluggable Wide-Ultra SCSI-3 Drive	336382-001 *
64	18.2-GB Pluggable Wide-Ultra SCSI-3, 10,000 rpm Drive	N/A *
	CONTROLLERS	
65	SMART-2SL Array Controller	242777-001 *
66	SMART-2DH Array Controller	295243-001 * 189639-001 *
67	Compaq Dual Channel Wide-Ultra SCSI-3 Controller	295626-001 *
	NETWORK CONTROLLERS	
68	Netelligent Dual 10/100 TX PCI UTP Controller	242560-001 *
69	Netelligent 4/16 TR PCI UTP/STP Controller	268010-001 *
70	Netelligent 10/100 TX PCI UTP Controller	317606-001 *

* Not Shown

Chapter 2

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for ProLiant 1850R Servers. After completing all necessary removal and replacement procedures, run the diagnostics program to verify that all components operate properly.

The following tools are recommended:

■   Torx T-15 screwdriver

■   Torx T-8 screwdriver

■   Nut driver

■   From the Compaq SmartStart and Support Software CD:

❏   System Configuration Utility software

❏   Drive Array Advanced Diagnostics software

❏   Diagnostics software

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

■ Transport products in static-safe containers such as conductive tubes, bags, or boxes.

■ Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.

■ Cover workstations with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.

■ Keep work area free of non-conductive materials such as ordinary plastic assembly aids and foam packing.

■ Make sure you are always properly grounded when touching a static-sensitive component or assembly.

■ Avoid touching pins, leads, or circuitry.

■ Always place drives PCB-assembly-side down.

■ Use conductive field service tools.

Symbols in Equipment

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator serviceable parts. To reduce risk of injury from electrical shock hazards, do not open this enclosure.

WARNING: Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To reduce risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

CLASS 1 LASER PRODUCT
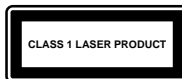
WARNING: This label or equivalent is located on the surface of your CD-ROM drive. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.
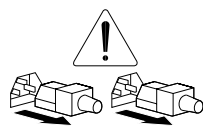
	WARNING: To reduce the risk of electrical shock or damage to the equipment, disconnect power from the server by unplugging all power cords from either the electrical outlet or the server.

Preparation Procedures

Before beginning any of the removal and replacement procedures:

1. Turn OFF the server and any peripheral devices.

2. Disconnect the AC power cord from the AC outlet, then from the server.

3. Disconnect all external peripheral devices from the server.

4. For most removal and replacement procedures, you must remove the server from the rack and place it on a sturdy table or workbench. Refer to the *ProLiant 1850R Setup and Installation Guide.*

> **WARNING:** To reduce the risk of personal injury, do not attempt to remove the server from the rack by yourself. A minimum of two people are required to remove the server from the rack.

> **WARNING:** Because the rack allows you to stack computer components on a vertical rather than horizontal plane, you must take precautions to provide for rack stability and safety. It is important that you follow these precautions to provide for rack stability and safety, and to protect both personnel and property. Heed all cautions and warnings throughout the installation instructions that came with the server.

> **CAUTION:** Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. See the section titled "Electrostatic Discharge" for more information.

Rack Warnings

⚠ **WARNING:** Always load the heaviest item first and load the rack from the bottom up. This makes the rack "bottom-heavy" and helps prevent the rack from becoming unstable.

⚠ **WARNING:** To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack.

⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, the bottom stabilizers on the equipment must be fully extended. Be sure that the equipment is properly supported/braced when installing options and cards.

⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 253 lb (115 kg), is over seven ft (2.1m) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet; handle it from the sides.

⚠ **WARNING:** A rack may become unstable if more than one component is extended for any reason. To reduce the risk of personal injury, be sure that the rack is adequately stabilized before extending a component outside the rack, and extend only one component at a time.

⚠ **WARNING:** Before beginning work on the rack, be sure that the leveling jacks are extended to the floor, that the full weight of the rack rests on the level floor, and that either stabilizers are installed or multiple racks are coupled for stability.

Server Warnings and Precautions

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

△ **CAUTION:** Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

△ **CAUTION:** The ProLiant 1850R Server must always be operated with system unit covers on. Proper cooling will not be achieved if the system unit covers
are removed.

Server Cover

Remove the server cover to gain access to drive bays, expansion slots, boards, and switches inside the server. To remove the server cover:

1. Perform the preparation procedures. See page 2-4.

2. Loosen the three captive thumbscrews on the rack-mount bezel.

3. Use the grip slot to slide the cover toward the rear of the unit about 1 inch (2.5 cm).

4. Move the server cover to the right side of the unit.

5. Lift off the server cover.
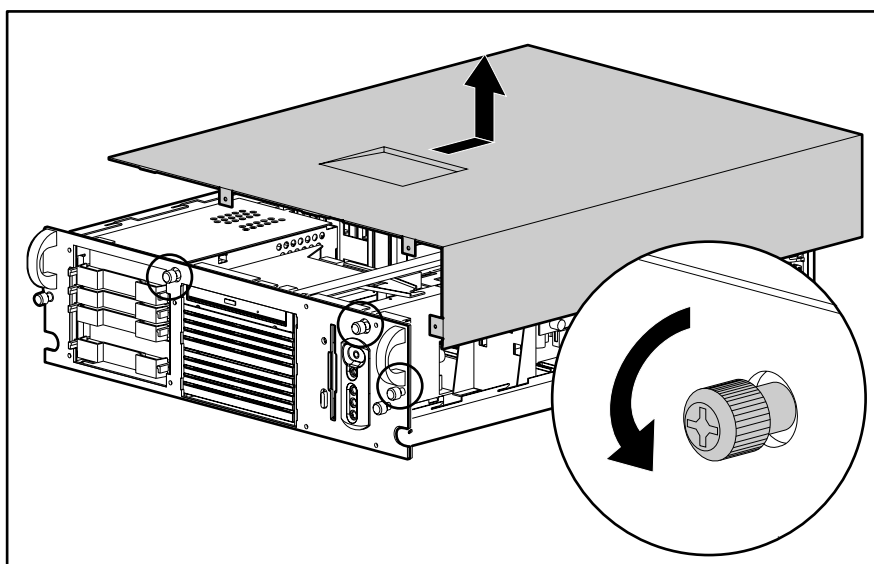
Figure 2-1. Removing the server cover

Reverse steps 1 through 5 to replace the server cover.

Rack-Mount Bezel

To remove the rack-mount bezel:

> ⚠ **WARNING:** Before removing the rack-mount bezel, be sure the computer is turned off and the power cord is disconnected from the electrical outlet.

1. Perform the preparation procedures. See page 2-4.

2. Loosen the five thumbscrews on the bezel.

3. Remove the eight T-15 screws from the front of the bezel.

4. Remove the rack-mount bezel.
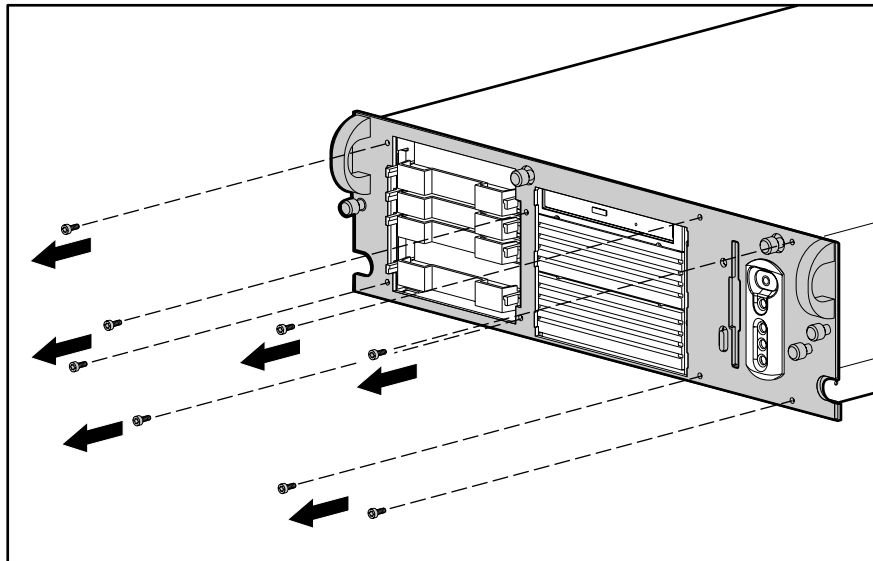
Figure 2-2. Removing the rack-mount bezel screws

Reverse steps 1 through 4 to replace the rack-mount bezel.

Power/Standby Switch with LEDs

To remove the power/standby switch with LEDs:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the diskette drive. See page 2-27.

4. Remove the two female connectors 1.

5. Remove the LEDs from the holders in the power/standby switch 2.
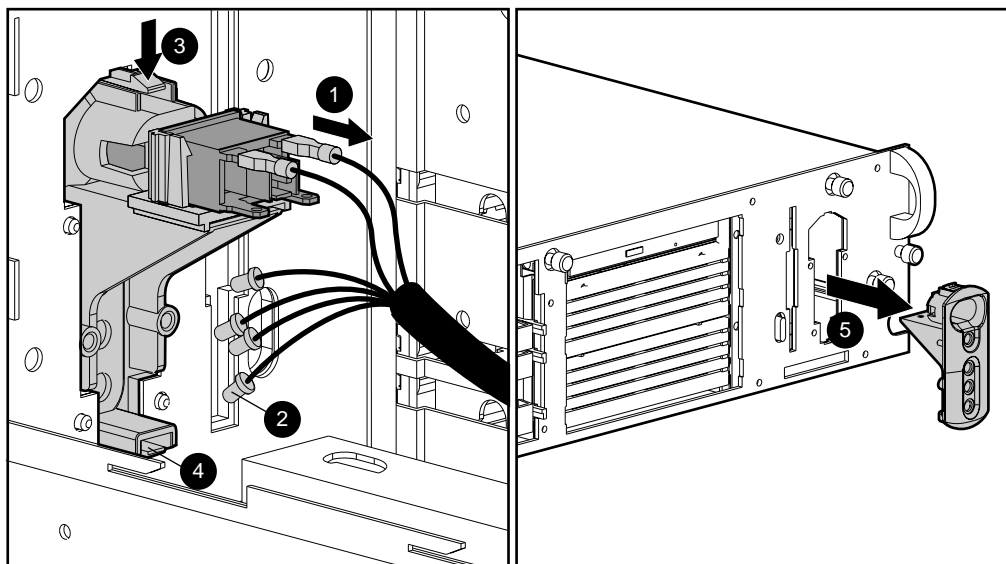
Figure 2-3. Removing the power/standby switch with LEDs

6. Push inward slightly at points 3 and 4 to release the power/standby switch from the bezel.

7. Remove the switch parts from the bezel 5.

Reverse steps 1 through 7 to replace the power/standby switch with LEDs.

> NOTE**: The LEDs have one flat side, which must be correctly oriented before insertion into
> the holder.**

Rear Fan

To remove the rear fan:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Unplug the rear fan from the system board 1.

4. Remove the four retention pins 2 attaching the fan assembly to the chassis.

5. Remove the rear fan 3.
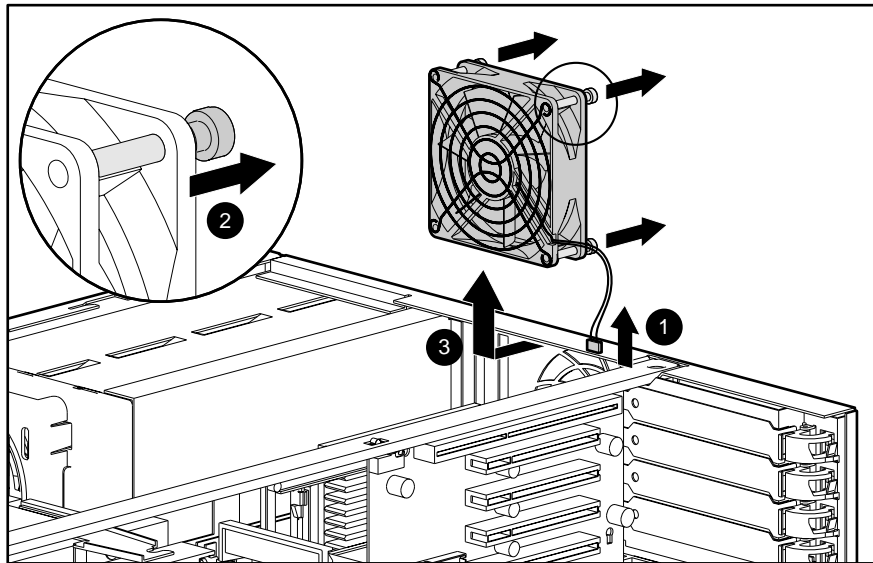
Figure 2-4. Removing the rear fan

Reverse steps 1 through 5 to replace the rear fan.

Drive Cage Fan and Bracket

To remove the drive cage fan and bracket:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Disconnect the data and power cables connected to the CD-ROM adaptor board (if installed) and the hot-plug SCSI backplane board.

4. Unplug the fan from the power supply.

5. Remove the three T-15 screws connecting the fan and bracket to the back of the drive cage.

6. Pull the fan and bracket away from the drive cage.
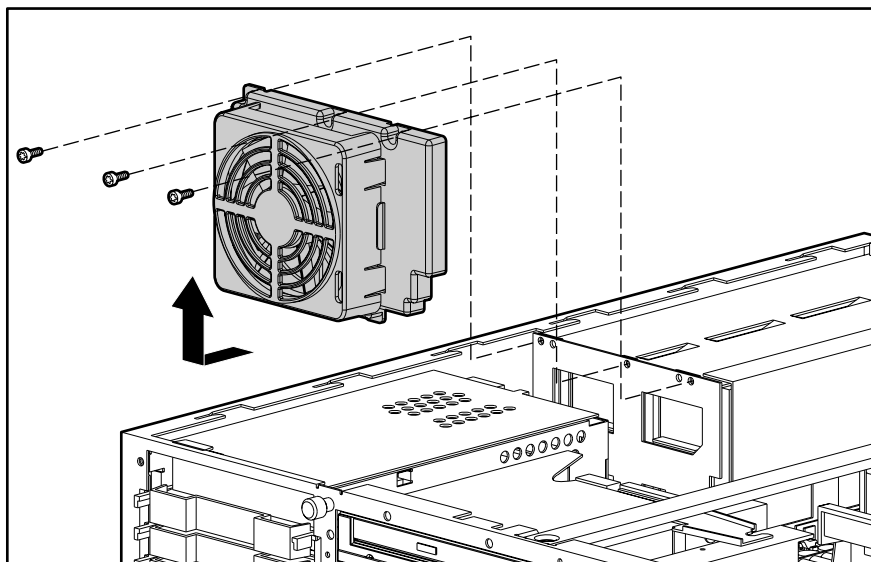
Figure 2-5. Removing the drive cage fan

Reverse steps 1 through 6 to replace the drive cage fan and bracket.

Drive Cage Fan Bracket

To disassemble the drive cage fan bracket:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the drive cage fan and bracket. See page 2-11.

4. Push in on the two push-lock fasteners 1 holding the bracket on the fan.

5. Remove the bracket and fan guard from the fan 2.
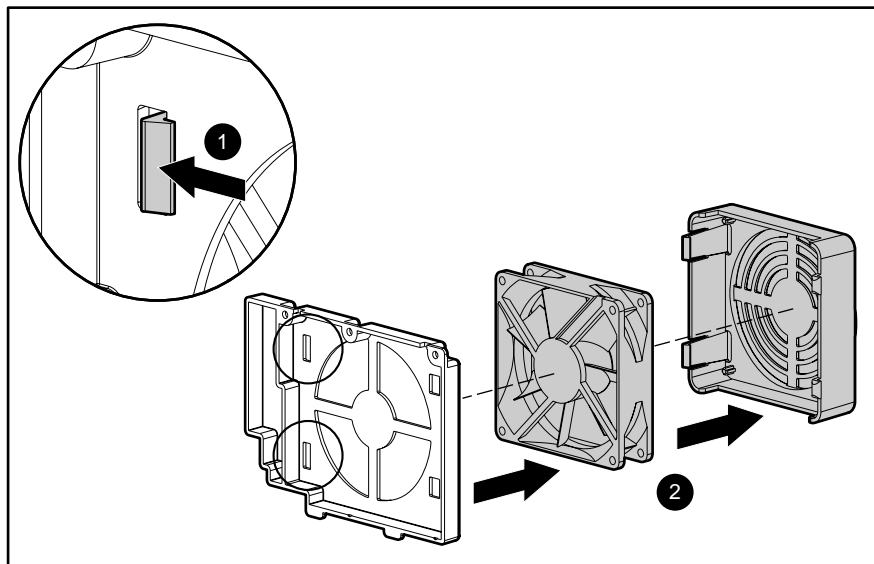
Figure 2-6. Disassembly of the drive cage fan bracket

Reverse steps 1 through 5 to assemble the drive cage fan bracket.

Hot-Plug Power Supply

The hot-plug power supply module is used for both the Compaq ProLiant 1850R server bays. To remove a hot-plug power supply, or to install an additional one:

> **IMPORTANT:** When using a single power supply module, it must populate the outer bay. Both bays can be populated for redundant power supply capability.

1. Perform the preparation procedures. See page 2-4.

2. Push in the port-colored tabs on the power supply blank 1.

3. Pull the tab out until it opens 2.

4. Pull the power supply blank out the back of the chassis 3.
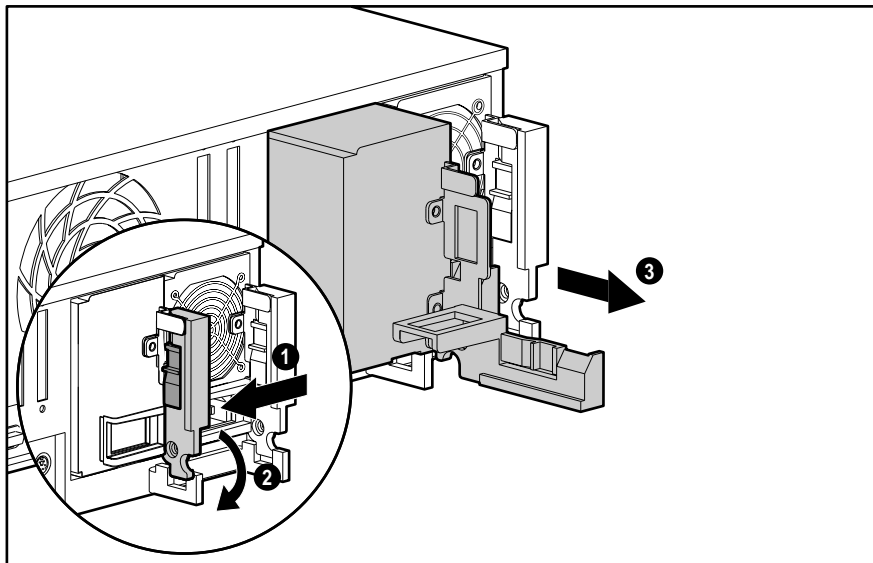
Figure 2-7. Removing the hot-plug power supply blank

5. Install the hot-plug power supply 1.

6. Push the tab 2 in until it locks.
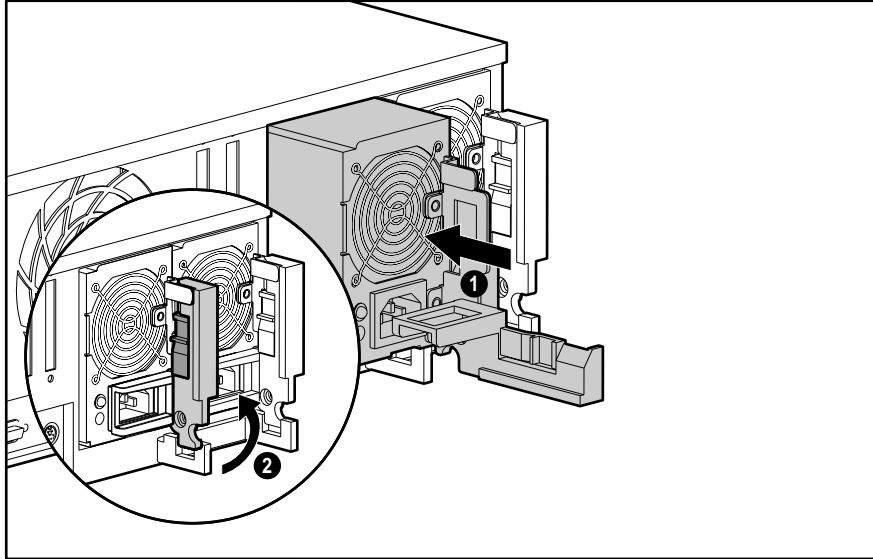
Figure 2-8. Installing a hot-plug power supply

Mass Storage Devices

Compaq ProLiant 1850R Servers can house up to 7 mass storage devices, including:

■ Preinstalled 3.5-inch, 1.44-MB diskette drive

■ Two available Half-Height 5.25-inch drive bays (removable media area)

■ Preinstalled 24X Max low-profile CD-ROM drive

■ Up to three 1-inch height or two 1.6-inch height Compaq hot-plug hard drives

Drive Installation Guidelines

When adding SCSI hard drives to the ProLiant 1850R Servers, observe the following guidelines:

■ A maximum of seven SCSI devices per controller may be added.

■ Each SCSI drive must have a unique address.

■ SCSI addresses (IDs) are automatically determined for drives installed in the hot-plug drive cage of the ProLiant 1850R. See Table 2-1.

■ Compaq non-hot-plug drive SCSI cables for the ProLiant 1850R servers are terminated. Remove all terminating jumpers from third-party SCSI devices.

■ The hot-plug SCSI backplane board provides proper termination for SCSI devices installed in hot-plug bays.

■ Supported Compaq SCSI options are not terminated.

The following chart provides the SCSI ID jumper settings for Compaq SCSI hard drives.

Table 2-1
SCSI ID Settings

SCSI ID	Bit 2	Bit 1	Bit 0
6	ON	ON	OFF
5	ON	OFF *	ON
4	ON	OFF*	OFF *
3	OFF *	ON	ON
2	OFF *	ON	OFF *
1	OFF *	OFF *	ON
0	OFF *	OFF *	OFF *

 * NOTE: OFF = jumper removed

ProLiant 1850R Drives

This section describes the drive bay positions, removal and replacement procedures, and hard drive installation for parts unique to the ProLiant 1850R Server.

Drive Bays

The ProLiant 1850R Server has five drive bays for internal mass storage devices. SCSI devices can be installed in drive bay 3, or attached to the external Fast-Wide SCSI-2 port via an external storage system.

> ⚠ **CAUTION:** The ProLiant 1850R server does not support the installation of IDE or EIDE fixed disk drives.
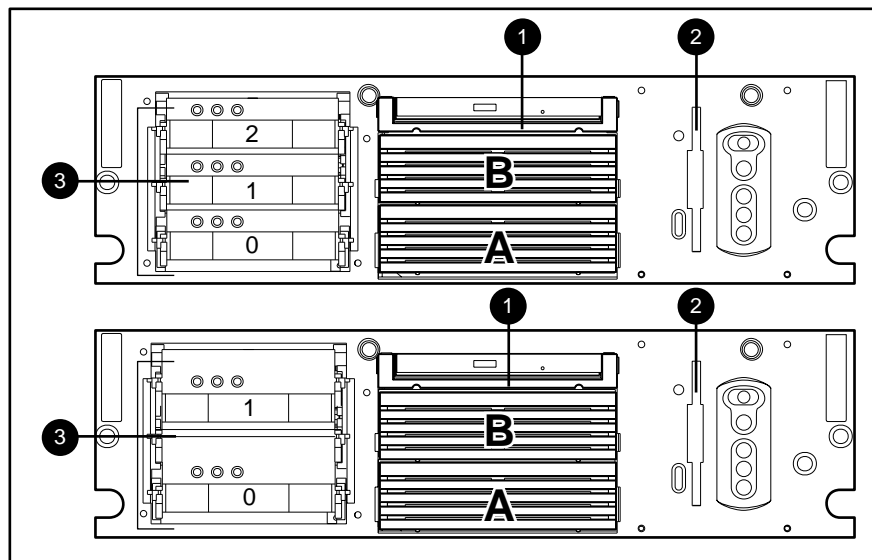
Figure 2-9. ProLiant 1850R server drive bay positions

Table 2-2
ProLiant 1850R Description of Drive Bays

Drive Bay	Configuration	SCSI IDs
A	5.25-inch x 1.6-inch height hot-plug hard drive bay (removable media area)	
B	5.25-inch x 1.6-inch height hot-plug hard drive bay (removable media area)	
1	24X Max low-profile CD-ROM drive	
2	3.5-inch, 1.44-MB standard diskette drive	2

2-17

3	Hot-Plug hard drive cage with either:	
	- Three 1-inch height Compaq hot-plug hard drives, or	0,1,2
	- Two 1.6-inch height Compaq hot-plug hard drives	0,1

Drive Cage

To remove the drive cage:

1.   Perform the preparation procedures. See page 2-4.

2.   Remove the three Torx T-15 screws securing the drive cage to the chassis.

3.   Disconnect the SCSI cable and power cable from the drive backplane board.

4.   Pull the drive cage back and up to remove it from the server.
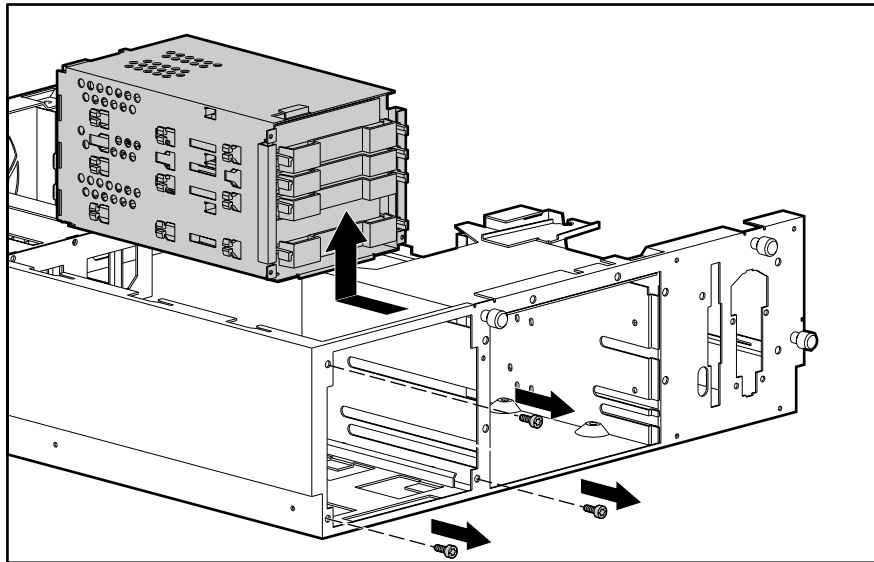
Figure 2-10. Removing the drive cage

Reverse steps 1 through 4 to replace the drive cage.

24X Max Low-Profile CD-ROM Assembly

To remove the 24X Max low-profile CD-ROM assembly:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the diskette drive. See page 2-27.

4. Remove the retaining screw securing the 24X Max low-profile CD-ROM to the chassis.

5. Pull the 24X Max low-profile CD-ROM from the drive cage.
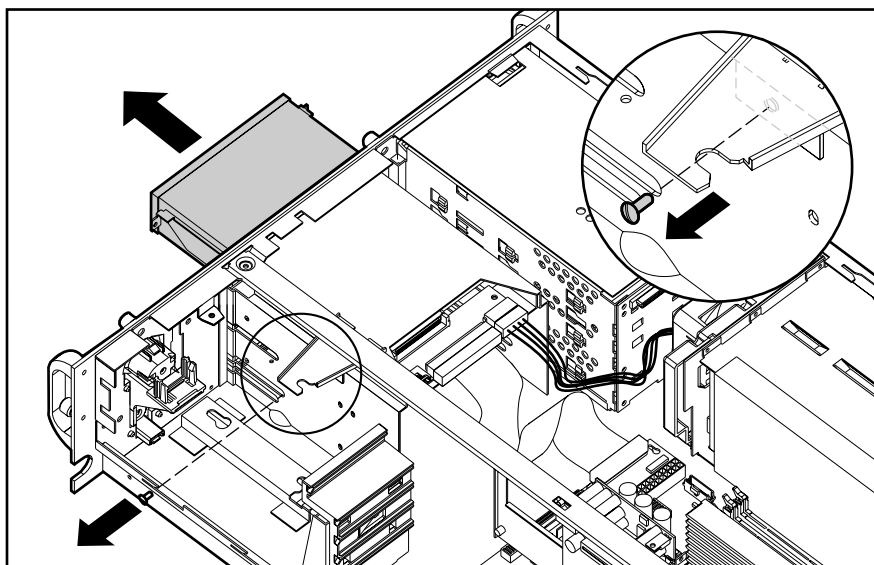
Figure 2-11. Removing the 24X Max low-profile CD-ROM assembly

Reverse steps 1 through 5 to replace the 24X Max low-profile CD-ROM assembly.

Installing a Non-Hot-Plug Hard Drive into Bay A or B

To install a non-hot-plug hard drive into bays A or B:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the diskette drive. See page 2-27.

4. Remove the 24X Max low-profile CD-ROM. See page 2-19.

5. Remove the T-15 torx screw 1 securing the removable media tray to the chassis and then slide the tray out of the server 2.
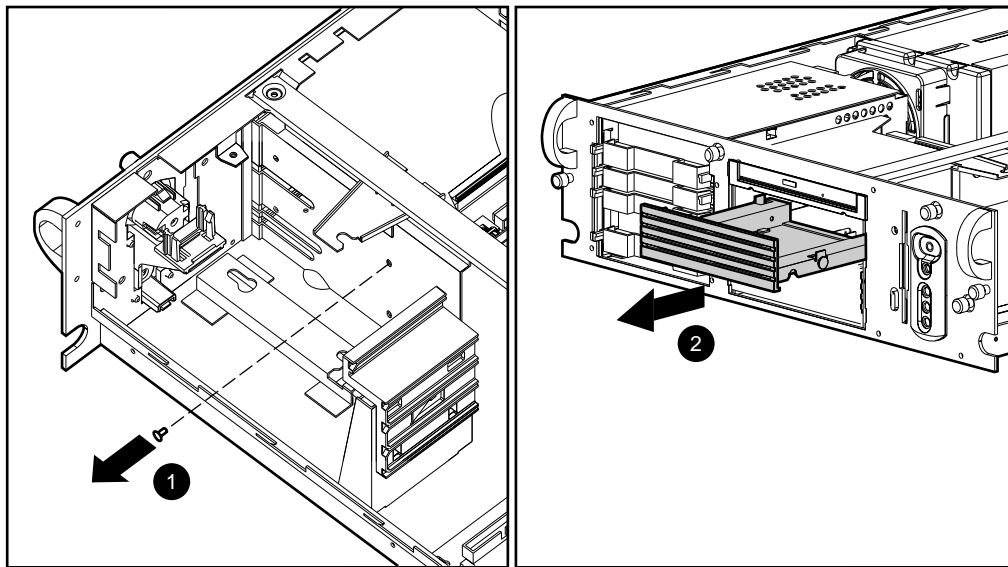
Figure 2-12. Removing the removable media tray from the server

6. Attach the non-hot-plug hard drive to the removable media tray with the four Torx screws provided.
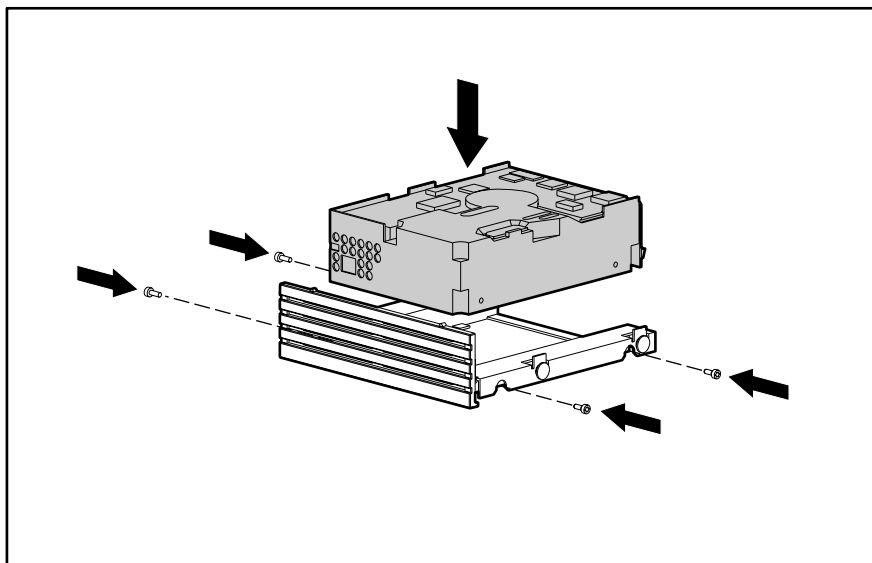
Figure 2-13. Attaching a non-hot-plug hard drive to the removable media tray

7. Install the drive assembly into the drive bay. Make sure the guide screw 1 lines up with the guide slot in the removable media drive cage.
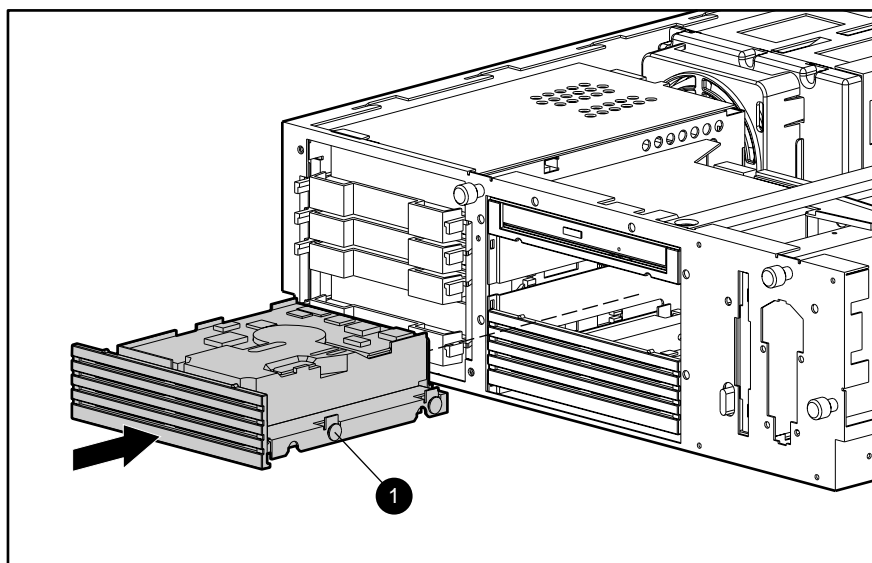
Figure 2-14. Installing and securing the drive into the chassis

8. Connect the cables drive power and signal cables.
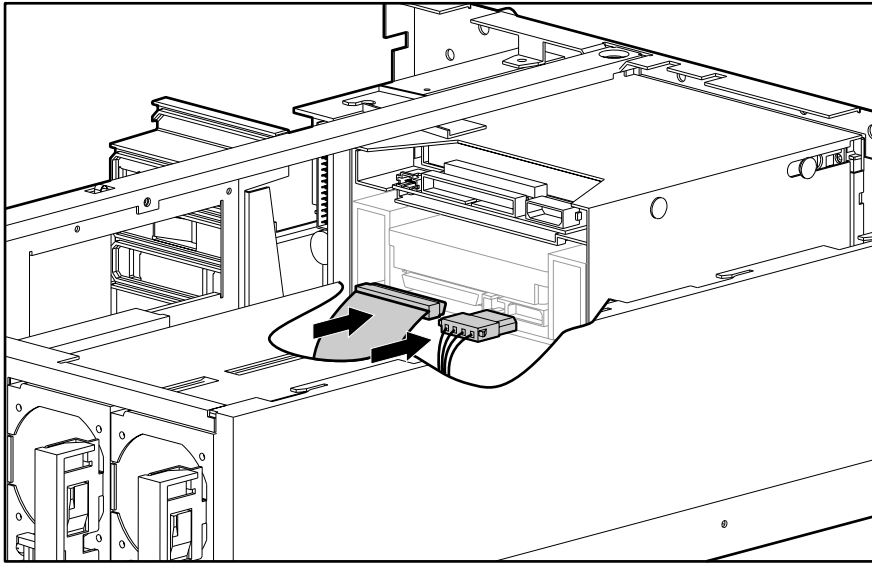
Figure 2-15. Connecting the drive cables

9. Replace the diskette drive.

10. Replace the server cover.

Installing a 1/2 Height Tape Drive or CD-ROM Drive in
Bay A or B

ProLiant 1850R Servers have two bays, bay A and bay B, for removable media. Bays A and B can accomodate two half-height or one full height device(s). Devices that can be installed include: an additional CD-ROM drive; 1-inch or 1.6-inch height hard drives (non-hot-plug); SLR, DAT, or DLT tape drives.

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the rack-mount bezel. See page 2-8.

4. Remove the T-15 torx screw 1 securing the media tray to the chassis then slide the tray out of the server 2.

5. Remove the removable media tray.
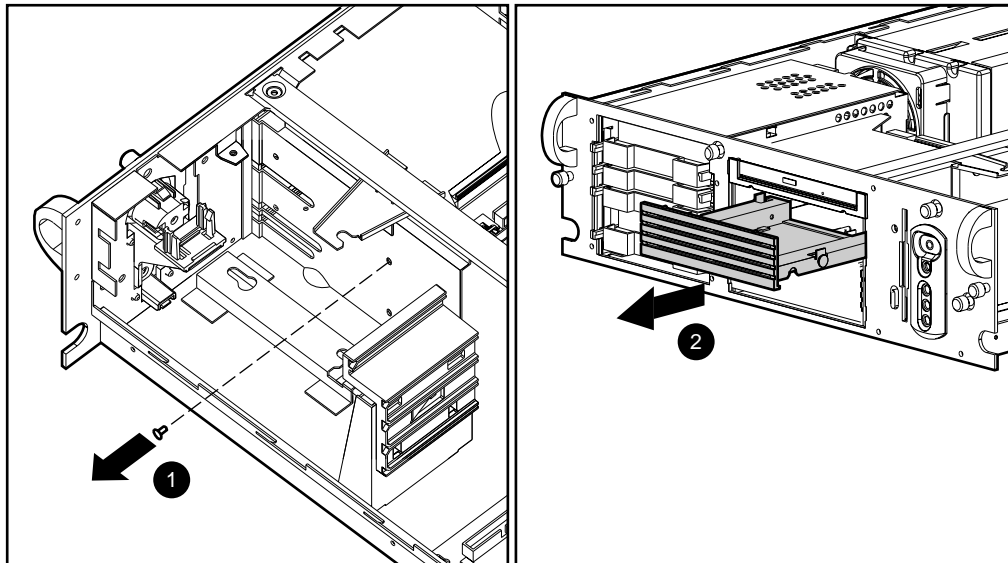
Figure 2-16. Removing the removable media tray

6. Insert the drive 1 into drive bay A or B.

7. Tighten the two screws 2 securing the drive in the drive cage.
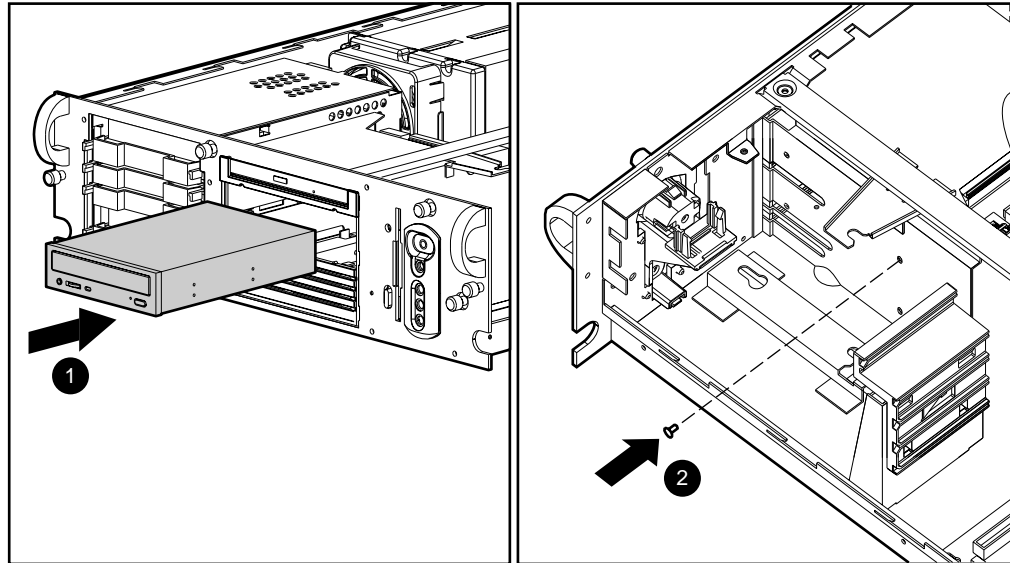
Figure 2-17. Installing a 1/2 height tape drive into bay A

8. Attach the IDE and power cables to the 1/2 height tape drive.

9. Connect the drive power and signal cables.
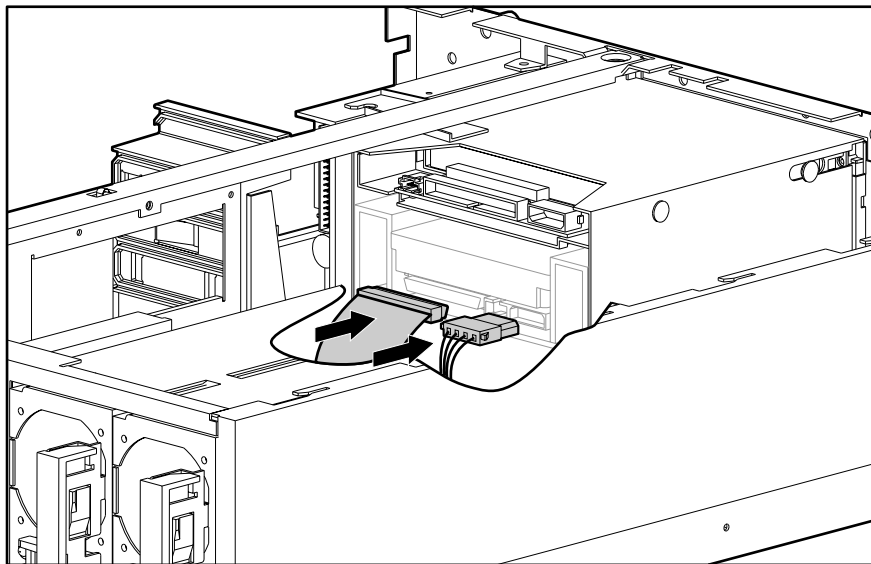
Figure 2-18. Connecting the drive cables

10. Replace the rack-mount bezel and server cover.

24X Max Low-Profile CD-ROM Adapter Board

To remove the 24X Max low-profile CD-ROM adapter board:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove the diskette drive. See page 2-27.

4. Disconnect the IDE cable and power cable from the adapter board 1.

5. Remove the two T-15 screws 2 attaching the adapter board to the chassis.

6. Pull the adapter board straight out the back of the 24X Max low-profile CD-ROM and lift it from the server 3.
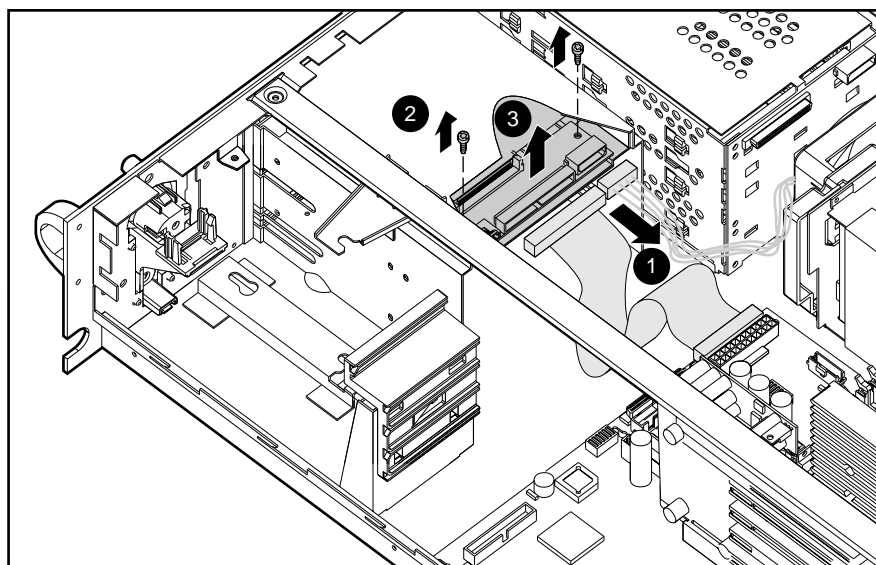
Figure 2-19. Removing the 24X Max low-profile CD-ROM adapter board

Reverse steps 1 through 6 to replace the 24X Max low-profile CD-ROM adapter board.

Installing a Hard Drive in Bay 0

The drive cage supports three 1-inch hard drives or two 1.6-inch hard drives. To install a 1-inch hard drive in bay 0:

1. Perform the preparation procedures. See page 2-4.

2. Insert the drive in the drive cage 1, sliding the hard drive guides into the mounting slots.

3. Close the connector levers 2.
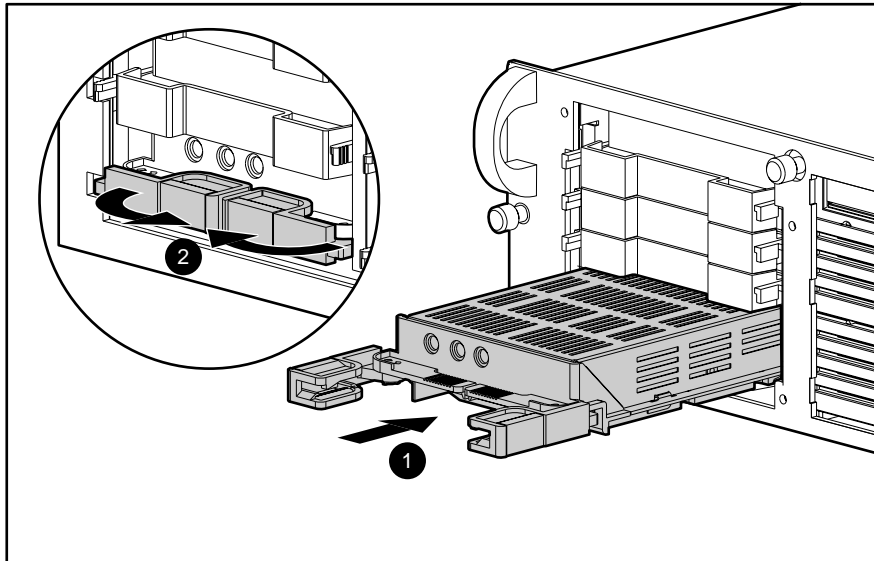
Figure 2-20. Installing a hard drive in bay 0

Diskette Drive

To remove the diskette drive:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Disconnect the power and data cables from the diskette drive (if installed).

4. Remove one T-15 screw 1 from the diskette drive.

5. Slide the diskette drive back, then away from the front bezel until it stops.

    NOTE**: Make sure the diskette eject lever clears the bezel when removing the diskette drive. Slide the diskette drive straight back from the front of the unit.**

6. Pull the diskette drive out 2 and lift it from the chassis 3.
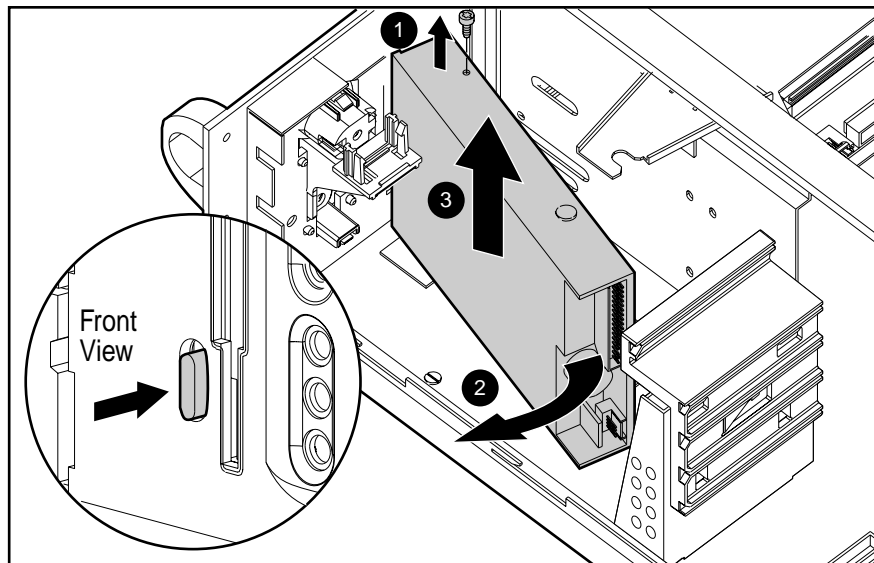
Figure 2-21. Removing the diskette drive

Reverse steps 1 through 6 to replace the diskette drive.

NOTE**: Make sure the diskette eject lever clears the bezel. Slide the diskette drive toward the back, then push it to the front of the unit.**

External Storage Devices

You can connect optional mass storage devices to the ProLiant 1850R by using the external Wide-Ultra SCSI-3 port on the back of the unit.

Cable Routing Diagrams

△ **CAUTION:** When routing cables, always make sure that the cables are not in a position where they will be pinched or crimped.

Diskette Drive Cable
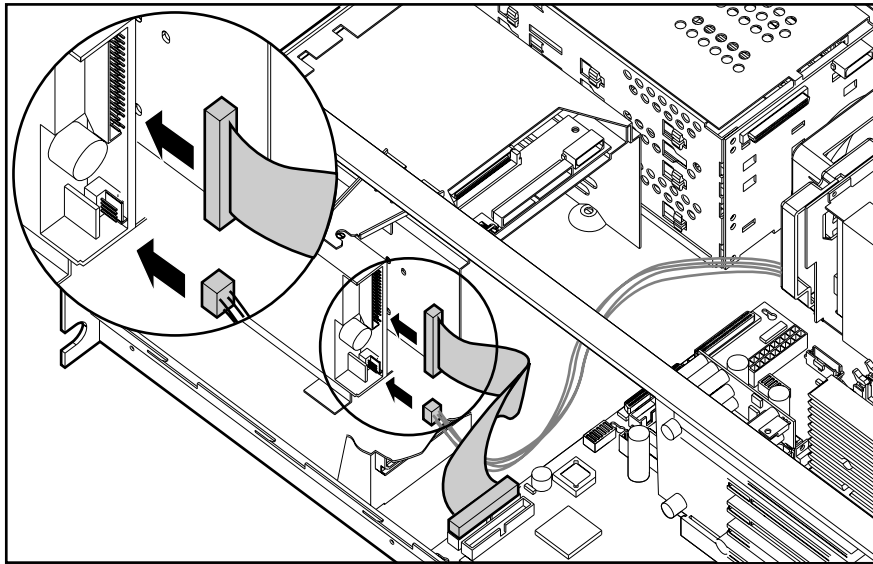
Figure 2-22. Diskette drive cable diagram

Low-Profile CD-ROM Cable
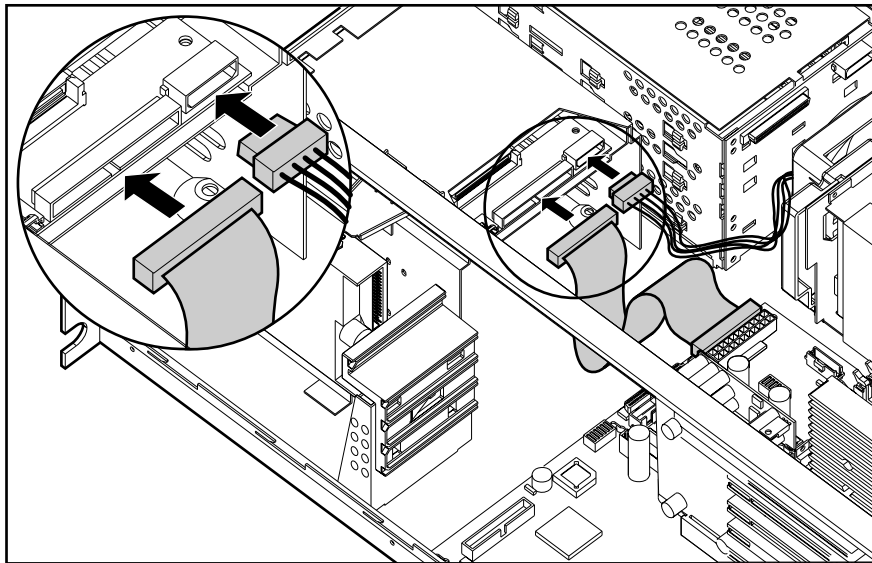
Figure 2-23. Low-profile CD-ROM cable diagram

Hot-Plug Drive Cage Cable
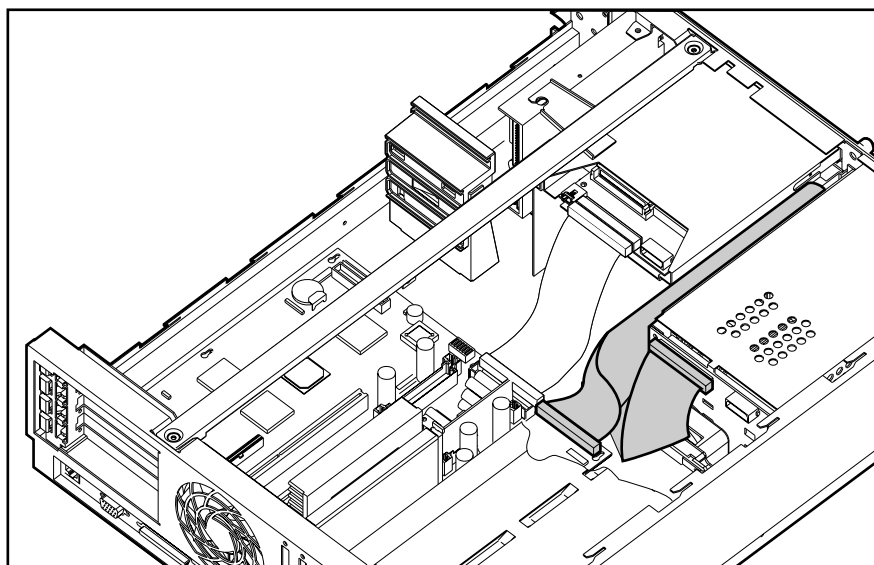
Figure 2-24. Hot-plug drive cage cable diagram

Internal SCSI Cable Attached to Array Controller
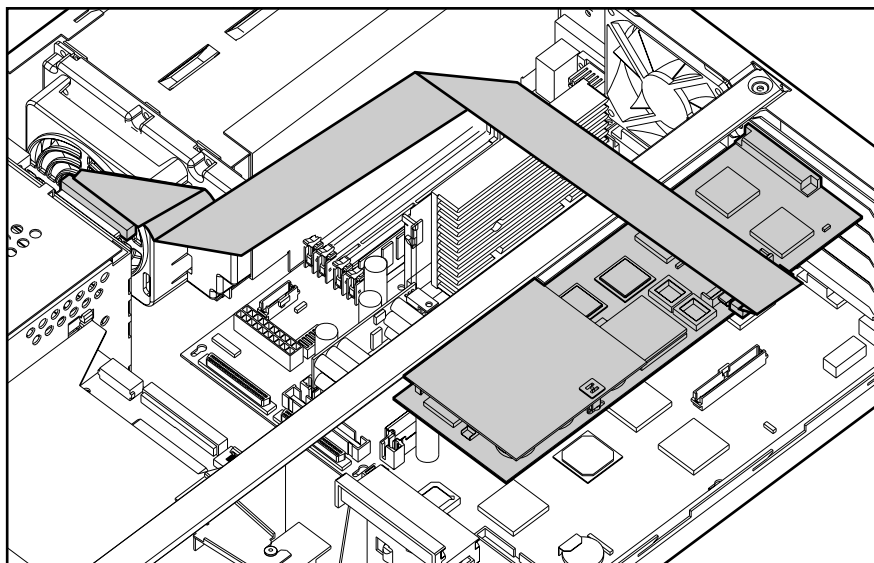
Figure 2-25. Internal SCSI cable diagram

Riser Board and Brace

To remove the riser board and brace:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove all expansion boards.

4. Loosen the two captive screws securing the riser board and brace 1.

5. Lift the riser board and brace out of the unit 2.
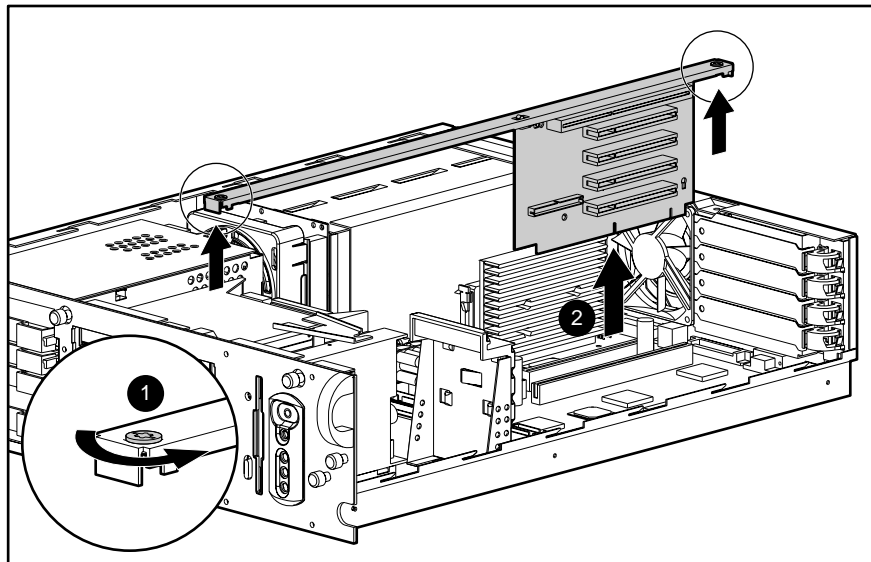
Figure 2-26. Removing the riser board and brace

Reverse steps 1 through 5 to replace the riser board and brace.

Memory

The ProLiant 1850R ships standard with a minimum 64 MB of Synchronous DRAM (SDRAM) DIMM memory, installed in slot 1. Memory can be expanded to a maximum of 1 GB. Install SDRAM DIMM modules one at a time in the proper slots. See Figure 2-27 and Table 2-3.
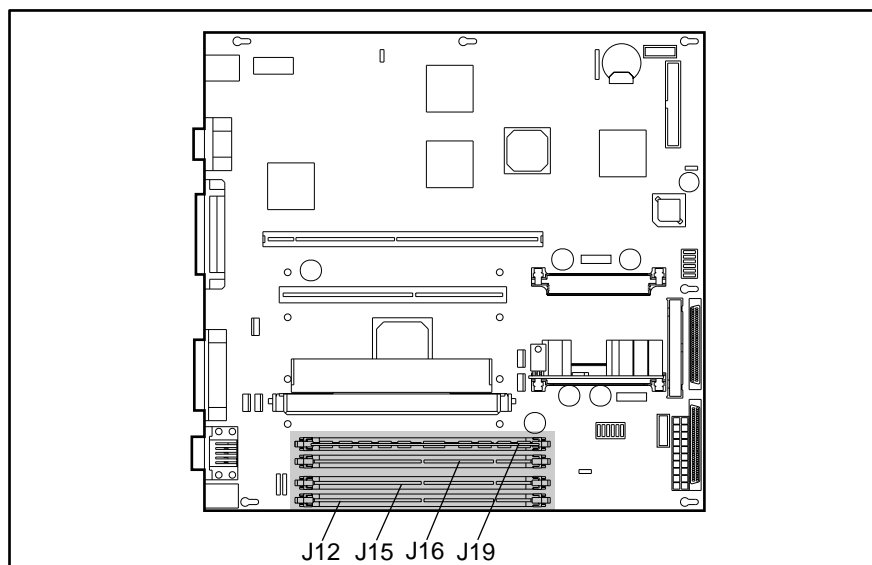
Figure 2-27. SDRAM DIMM slot locations

To remove a SDRAM DIMM:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove any expansion boards above the SDRAM DIMM slot.

4. Press both SDRAM DIMM slot latches outward 1.

5. Lift out the SDRAM DIMM 2.
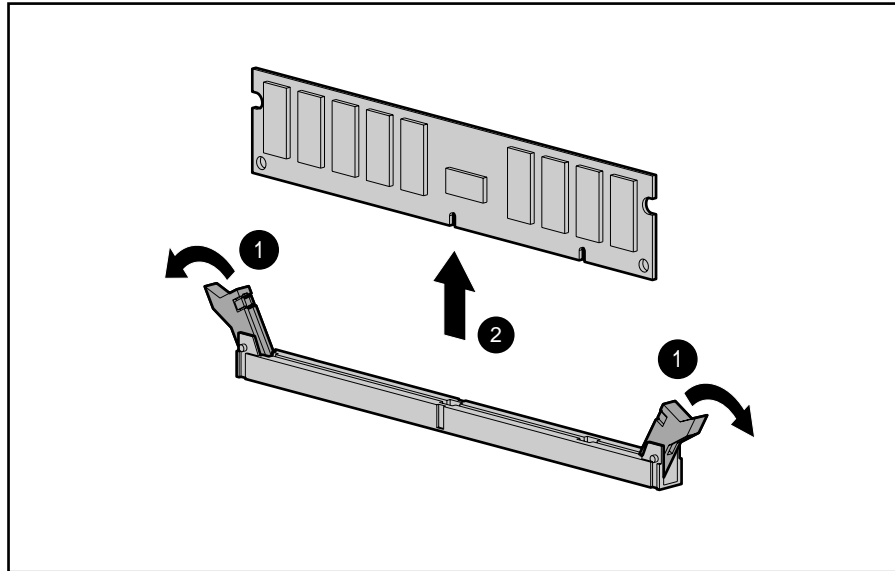
Figure 2-28. Removing a SDRAM DIMM

Reverse steps 1 through 5 to replace a SDRAM DIMM.

> **IMPORTANT:** A memory module can be installed one way only. Be sure to match the key slots on the module with the tabs on the memory slot. Push the module down into the slot, ensuring that the module is fully inserted and properly seated.

The following guidelines **MUST** be followed when installing or replacing memory:

■ Use only 32-, 64-, 128-, or 256-MB SDRAM DIMMs.

■ SDRAM DIMMs must be 100 MHz.

■ Use Compaq SDRAM DIMMs only.

■ SDRAM DIMMs must all be the same speed, and rated 100 MHz.

The recommended order of SDRAM DIMM installation is:

■ Second SDRAM DIMM in slot 2 (J15)

■ Third SDRAM DIMM in slot 3 (J16)

■ Fourth SDRAM DIMM in slot 4 (J19)

Any combination of SDRAM DIMMs can be used.

Table 2-3
Examples of SDRAM DIMM Upgrade Combinations

Total Memory	Slot 1	Slot 2	Slot 3	Slot 4
64 MB	32 MB	32 MB		
64 MB	64 MB	32 MB		
96 MB	64 MB			
128 MB	64 MB	64 MB		
240 MB	64 MB	128 MB		
256 MB	128 MB	128 MB	32 MB	
256 MB	64 MB	64 MB	64 MB	64 MB
384 MB	64 MB	64 MB	128 MB	128 MB
512 MB	128 MB	128 MB	128 MB	128 MB
1 GB	256 MB	256 MB	256 MB	256 MB

Processor

ProLiant 1850R Servers can support up to two processors. Figure 2-29 and Table 2-4 depict the location of processor(s) and processor power module(s) on the system board.
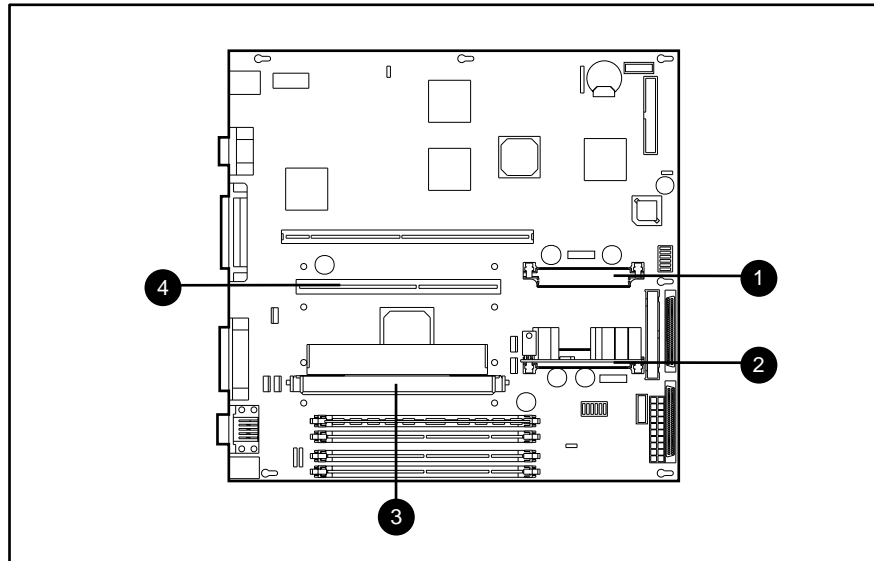
Figure 2-29. Processor and processor power module locations

Table 2-4
Processor and Processor Power Module Locations

Location	Description
1	Processor Power Module Slot 1
2	Processor Power Module Slot 2
3	Intel Pentium II Processor
4	Intel Pentium II Processor

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To remove either of the processors:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Push in the retaining clips on each side of the processor 1.

4. Pull out the processor 2.
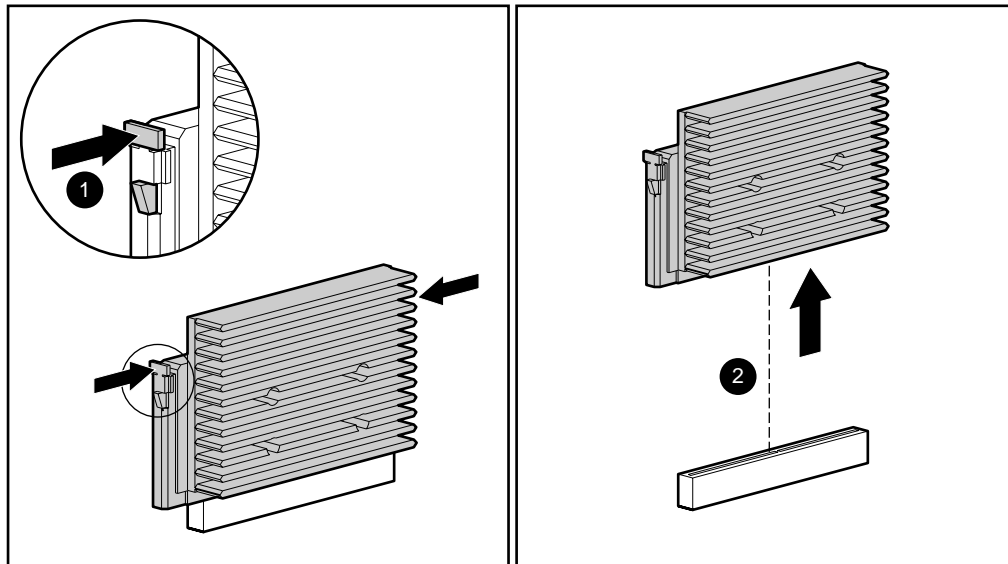
Figure 2-30. Removing the processor

Reverse steps 1 through 4 to replace the processor. Use the System Configuration Utility to reconfigure your system if you are replacing a faulty processor. See Chapter 3 for more information.

> **CAUTION:** Processors on the same processor board MUST be installed in matched frequency.

IMPORTANT: The processor is keyed to be sure correct alignment. Align the pattern of pins in the processor with the pattern of holes in the socket. The pins and holes will not line up if the processor is turned the wrong way.

Processor Power Module

Every processor comes with a processor power module (DC-to-DC converter) that provides power for the processor.

> ⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

To remove a processor power module:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Press the socket latches 1 outward with your index fingers until the latches snap open.

4. As the socket latches open, the module comes out of the socket 2.
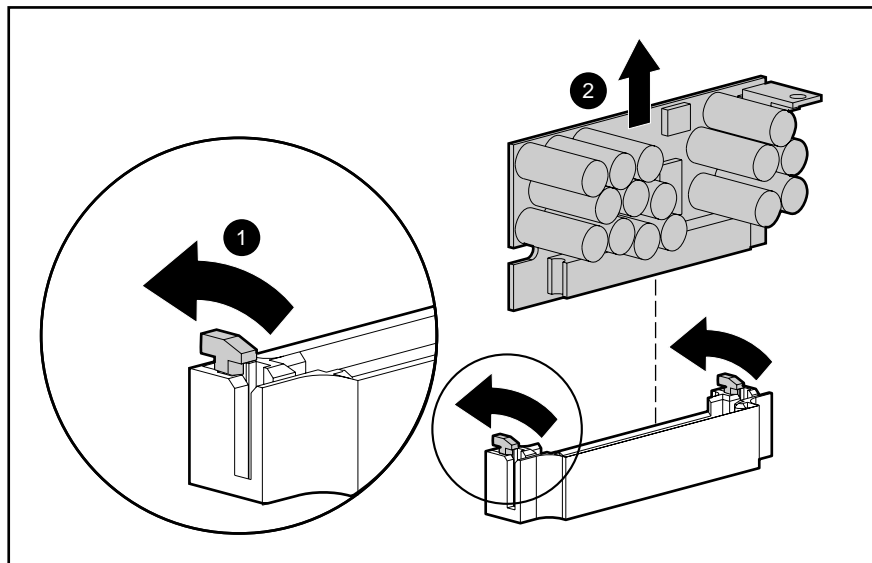
Figure 2-31. Removing a processor power module

Reverse steps 1 through 4 to install a processor power module. The processor power module is keyed to ensure correct alignment. Use the System Configuration Utility to reconfigure the server. See Chapter 3 for more information.

System Board

To remove the system board:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Remove all expansion boards.

4. Remove the Riser board and brace. See page 2-30.

5. Disconnect the cables both in and out of the chassis. See page 2-28.

6. Remove any SDRAM DIMMs. See page 2-31.

7. Remove the processor(s). See page 2-34.

8. Remove the processor power module(s). See page 2-36.

9. Remove the ten nuts and one screw 1 securing the connector plate.

10. Remove the eight T-15 screws 2 mounting the processor(s) to the chassis.

11. Slide the system board back, then lift it from the chassis 3.
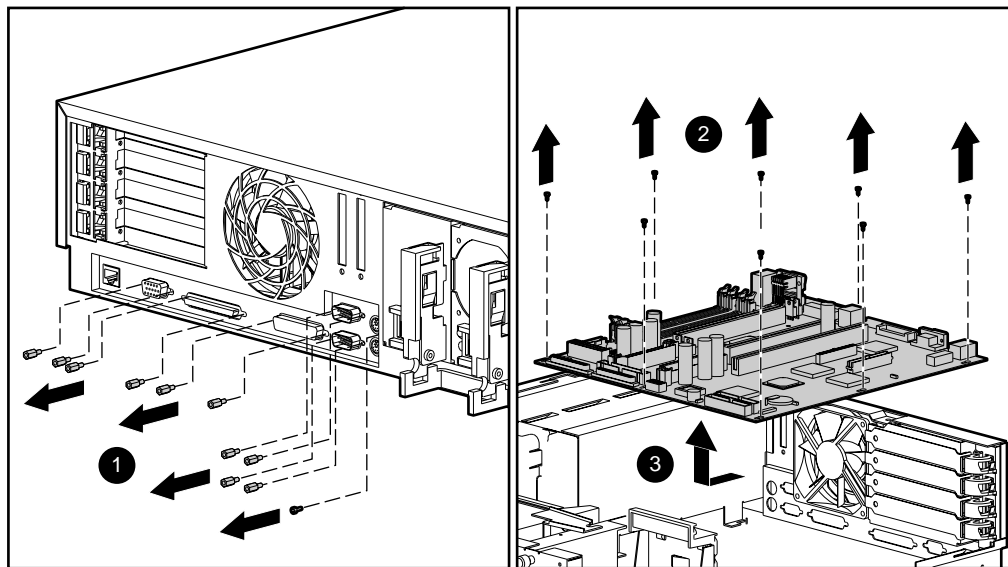
Figure 2-32. Removing the system board

Reverse steps 1 through 11 to replace the system board.

> **IMPORTANT:** Make sure the system board seats properly over the chassis
> retaining guides, then slide it back into place.

External Replacement Battery

ProLiant 1850R Servers contain one battery that might require the installation of an external replacement on the system board.

System Board Battery

If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is approximately five to ten years.

> ⚠ **WARNING:** The system board contains a clock/CMOS lithium battery, which can explode if mistreated. The battery is soldered in place and can not be removed. Do not abuse or disassemble. Use only replacement batteries supplied by Compaq Computer Corporation.

To install an external battery on the system board:

1. Perform the preparation procedures. See page 2-4.

2. Remove the server cover. See page 2-7.

3. Locate the battery header as depicted in the following illustration.

4. Change the jumper on header E2 from pins 6-7 to pins 5-6.
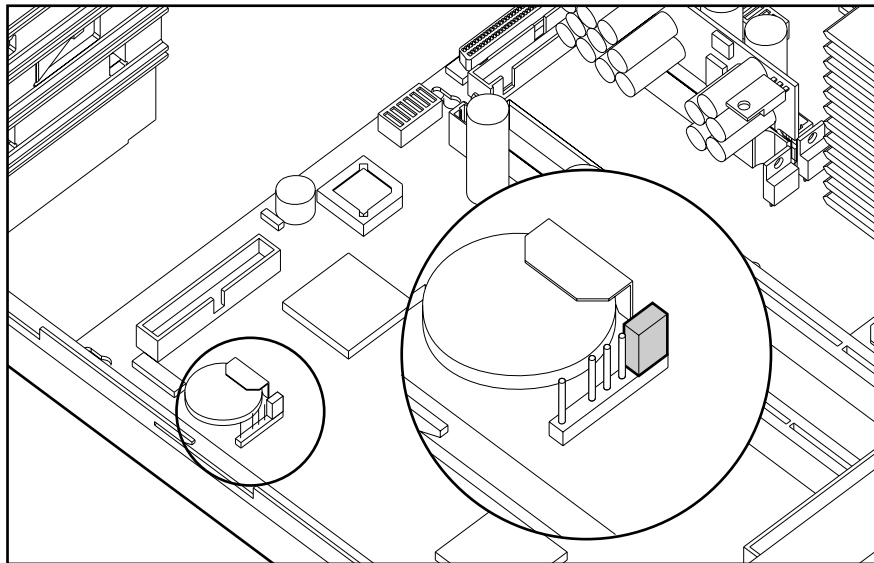
Figure 2-33. Battery jumpers on the system board

> **IMPORTANT:** When a jumper is on header E2 / pins 6-7, the internal battery is used. When a jumper is on header E2 / pins 5-6, the external battery is used.

> **IMPORTANT:** The system board contains a Lithium Manganese Dioxide or Lithium Vanadium Pentoxide battery that should not be disposed of together with the general waste. In order to forward it to recycling or proper disposal, please use the public collection system or return it to Compaq, or your authorized Compaq Partners.

5. Remove the backing from the adhesive on the hook-and-loop fastener strip attached to the battery.

6. Place the battery and the hook-and-loop fastener strip on the designated chip, as shown in the following illustration.

7. Plug the battery connector onto pins 1-4 of header E2 on the system board.
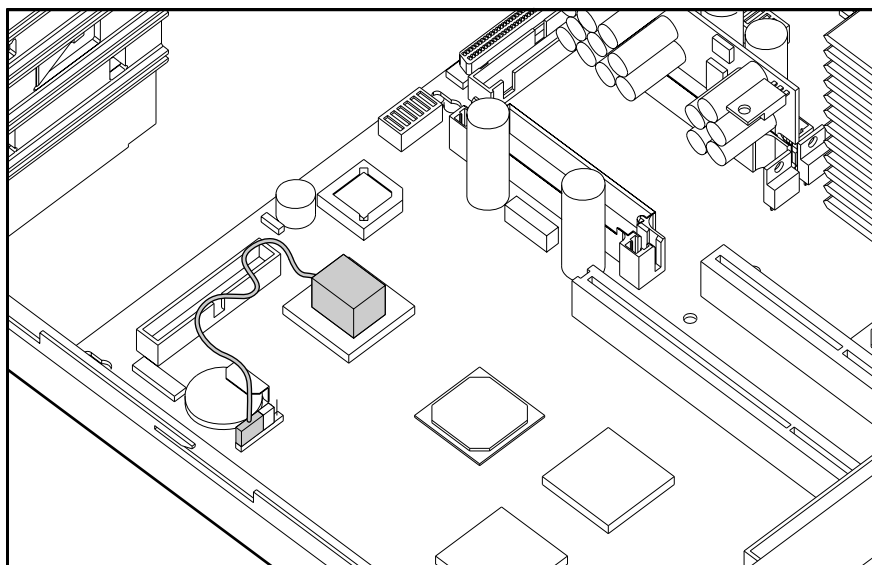
Figure 2-34. Attaching the battery to the battery jumpers

8. Place the sticker included with your battery kit on the back of your server above the power connector.

9. Run the Compaq System Configuration Utility to reconfigure the system. See Chapter 3 for more information.

Chapter 3
Diagnostic Tools

This chapter describes software and firmware diagnostic tools available for all Compaq server products. The sections in this chapter are:

■ Default Configuration

■ Utility Access

■ Power-On Self-Test (POST)

■ Diagnostics Software

■ Drive Array Advanced Diagnostics (DAAD)

■ Integrated Management Log

■ Rapid Recovery Services

■ Remote Service Features

■ ROMPaq

■ Compaq Insight Manager

Default Configuration

When the system is first powered on, the system ROM detects the unconfigured state of the hardware and provides default configuration settings for most devices. By providing this initialization, the system can run Diagnostics and other software applications before running the normal SmartStart and System Configuration programs.

Default Configuration Messages

> **IMPORTANT:** If you chose to format and partition your boot drive before running SmartStart and the System Configuration programs, this may prohibit creating a System Partition and the off-line remote management features that it provides.

If you insert a System Configuration, Diagnostics, or SmartStart CD in the CD-ROM drive prior to powering on the Server, the system ROM will boot to that utility. If the system ROM does not detect one of those Cds, you will be prompted for your intended operating system. The system will reboot if any operating system-dependent configurations have changed with the new operating system selection. If the selected operating system-dependent configurations are the same as the current configurations, the system will boot normally. If you enter a wrong choice, on subsequent re-boots, you may change your operating system.

Utilities Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain your system, including:

■   System Configuration Utility

■   Array Configuration Utility

■   Drive Array Advanced Diagnostics Utility

■   ROMPaq Firmware Upgrade Utilities

> $\triangle$ **CAUTION:** Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

There are several ways to access these utilities:

■   **Run the utilities on the system partition.**

  If the system was installed using SmartStart, the Compaq utilities will automatically be available on the system partition. The system partition could also have been created during a manual system installation.

To run the utilities on the system partition, boot the system and press **F10** when you see "Press F10 for system partition utilities." Then select the utilities from the menu.

❏ System Configuration Utility is available under the System Configuration menu.

❏ Array Configuration Utility is available under the System Configuration menu.

❏ Drive Array Advanced Diagnostics Utility is available under the Diagnostics and Utilities menu.

❏ ROMPaq Firmware Upgrade Utility is available under the Diagnostics and Utilities menu.

■ **Run the utilities from diskette.**

You can also run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.

You can also create a diskette version of the utility from the SmartStart and Support Software CD. To create diskette versions of the utilities from the CD:

1. Boot the Compaq SmartStart and Support Software CD.

2. From the Compaq System Utilities screen, select *Create Support Software → Next*.

3. Select the diskette you would like to create from the list, then follow the instructions on the screen.

■ **Run the utilities from the Compaq SmartStart and Support Software CD.**

> **IMPORTANT:** Only the System Configuration Utility and the Array Configuration Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities must be executed only from the system partition or from diskette.

To run these utilities directly from the Compaq SmartStart and Support Software CD:

1. Start the Compaq SmartStart and Support Software CD.

2. From the Compaq System Utilities screen, select the utility you wish to run, and select *Next*.

   ❏ To execute the System Configuration Utility, select *Run System Configuration Utility*.

   ❏ To execute the Array Configuration Utility, select *Run Array Configuration Utility*.

Power-On Self-Test (POST)

POST is a series of diagnostic tests that run automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

■ Processors

■ Keyboard

■ Power supply

■ System board

■ Memory

■ Memory expansion boards

■ Controllers

■ Diskette drives

■ Hard drives

If POST finds an error in the system, an audible and/or visual message appears. If an error code appears on the screen during POST or after resetting the system, follow the instructions in Table 3-1. Error messages and codes listed in Table 3-1 include all codes generated by Compaq products. Your system generates only those codes that are applicable to your configuration.

The Action column lists the steps needed to correct the problem. After completing each step, run the Diagnostics program. If the error code reappears, perform the next step, then run the Diagnostics program again. Repeat this procedure until the error is corrected.

Table 3-1
POST Error Messages

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
A Critical Error occurred prior to this power-up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
101-ROM Error	1L,1S	System ROM checksum.	Run Diagnostics. Replace failed assembly as indicated.
101-I/O ROM Error	None	Options ROM checksum.	Run Diagnostics. Replace failed assembly as indicated.
102-System Board Failure	None	DMA, timers, etc.	Replace the system board. Run the Compaq System Configuration Utility.

104-ASR-2 Timer Failure	None	System board failure.	Run Diagnostics. Replace failed assembly as indicated.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
162-System Options Not Set	2S	Configuration incorrect.	Run the System Configuration Utility and correct.
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Run the System Configuration Utility and correct.
170- Expansion Device Not Responding	None	EISA or PCI expansion board failure.	Check board for secure installation. Replace the failed board if necessary.
172- Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt or jumper installed.	Run the System Configuration Utility and correct.
172-1 Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt.	Run the System Configuration Utility and correct.
172-2 IRC Configuration Invalid	None	IRC enabled and video controller is in PCI slot on the secondary bus.	Move video controller to a PCI slot on the primary PCI bus.
173- Slot ID Mismatch	None	Board replaced, configuration not updated.	Run the System Configuration Utility and correct.
174- Configuration/Slot Mismatch Device Not Found	None	EISA or PCI board not found.	Run the System Configuration Utility and correct.
175- Configuration/Slot Mismatch Device Found	None	EISA or PCI board added, configuration not updated.	Run the System Configuration Utility and correct.
176-Slot with Not Readable ID Yields Valid ID	None	EISA or PCI board in slot that should contain an ISA board.	Run the System Configuration Utility and correct.

177-Configuration Not Complete	None	Incomplete System Configuration.	Run the System Configuration Utility and correct.
178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the System Configuration Utility and correct.
179-System Revision Mismatch	None	A board was installed that has a different revision date.	Run the System Configuration Utility and correct.
180-Log Reinitialized	None		

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
201-Memory Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.
203-Memory Address Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.
205-Cache Memory Error	None	Cache memory error.	Replace the processor board in the slot indicated.
205-Option Cache Memory Error	None	Option cache memory error.	Replace the option cache board.
206-Cache Controller Error	None	Cache controller failure.	Run Diagnostics. Replace failed assembly as indicated.
207-Invalid Memory Configuration - Check DIMM [SIMM] Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed - Check DIMM [SIMM] Installation	1L, 1S	The speed of the memory is too slow, where: xx00 = expansion board SIMMs are too slow, or 00yy = system board SIMMs are too slow. xx and yy have corresponding bit set.	The speed of the memory modules must be 60 ns. Verify the speed of the memory modules installed and replace.
210- Invalid Memory Configuration Detected. System halted.	None	Maximum amount of memory exceeded.	Verify installed memory does not exceed 1 GB.
211-Cache Switch Set Incorrectly	None	Switch not set properly during installation or upgrade.	Verify switch settings.
212-System Processor Failed/Mapped out	1S	Processor in slot x failed.	Run Diagnostics and replace failed processor.

213-Cache Size Error	None	Invalid optional cache size.	Replace cache with 256K cache.
213-System Processor Not Installed	1S	System processor configured for slot indicated is missing.	Install processor in the slot indicated or run the System Configuration Utility to remove the processor from the *CFG* file.
214-DC-DC Converter Failed	None	PowerSafe Module (DC-DC Converter) failed.	Run Diagnostics. Replace failed assembly as indicated.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
301-Keyboard Error	None	Keyboard failure.	Turn off the computer, then reconnect the keyboard.
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure.	Replace the keyboard.
ZZ-301-Keyboard Error	None	Keyboard failure. (*ZZ* represents the Keyboard Scan Code.)	1. A key is stuck. Try to free it. 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure.	1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure.	1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.
40X-Parallel Port X Address Assignment Conflict	2S	Both external and internal ports are assigned to parallel port X.	Run the System Configuration Utility and correct.
402-Monochrome Adapter Failure	1L, 2S	Monochrome display controller.	Replace the monochrome display controller.
501-Display Adapter Failure	1L, 2S	Video display controller.	Replace the video board.
601-Diskette Controller Error	None	Diskette controller circuitry failure.	1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace the system board.
605-Diskette Drive Type Error	2S	Mismatch in drive type.	Run the System Configuration Utility to set diskette type correctly.

702-A coprocessor has been detected that was not reported by CMOS	None	Installed coprocessor not configured.	Run the System Configuration Utility and correct.

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
703-CMOS reports a coprocessor that has not been detected	2S	Coprocessor or configuration error.	1. Run the System Configuration Utility and correct. 2. Replace the coprocessor.
1151-Com Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run the System Configuration Utility and correct.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2, COM3 or COM4.	Run the System Configuration Utility and correct.
1600-Server Manager/R Failure	None	Server Manager/R board failure. Error code displays after error message.	Run Diagnostics. Replace failed assembly as indicated.
1610-Temperature violation detected. Waiting for system to cool	2S	Ambient system temperature too hot.	Check fan in system environment.
1611-Fan [fan description] failure detected	2S	Required fan has failed.	Check fans.
1611- Fan [fan description] not present	2S	Fan not present.	Make sure fans are plugged in.
1612-Primary power supply failure	2S	Primary power supply has failed.	Replace power supply as soon as possible.
1613-Low System Battery	None	Real time clock system battery is running low on power.	Run Diagnostics. Replace failed assembly as indicated.

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1615- Power Supply Failure in Bay X	None	A power supply has failed.	Replace or check specified power supply.
1616- Power Supply Configuration Error	2L, 2S	Single power supply system is installed in Bay 2 and not in Bay 1.	Move power supply from Bay 2 to Bay 1.
1701-SCSI Controller failure	None	A test on the Fast SCSI-2 Controller failed	Run Diagnostics. Replace failed assembly as indicated.

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1702-SCSI cable error detected. System halted.	None	Incorrect cabling.	1. For integrated SCSI Controllers, ensure that the internal connector has SCSI termination attached. 2. For option card SCSI controllers, ensure that only one of the two internal connectors has termination attached.
1703-SCSI cable error detected. Internal SCSI cable not attached to system board connector. System halted.	None	Incorrect cabling.	Ensure that the integrated SCSI controller has SCSI termination attached.
1704-Unsupported Virtual Mode Disk Operation. DOS Driver Required. System halted.	None	System attempted to perform a virtual mode disk operation without virtual mode memory services.	Use fixed-disk device driver that supports virtual mode memory services.
1705-Locked SCSI Bus Detected. System halted.	None	SCSI bus failure.	Run Diagnostics. Replace failed assembly as indicated.
1730-Fixed Disk 0 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1731-Fixed Disk 1 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1740-Fixed Disk 0 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.

1741-Fixed Disk 1 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1750-Fixed Disk 0 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1751-Fixed Disk 1 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1760-Fixed Disk 0 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1761-Fixed Disk 1 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1764-Slot x Drive Array - Capacity Expansion Process is temporarily disabled (followed by one of the following): Expansion will resume when Array Accelerator has been reattached. Expansion will resume when Array Accelerator has been replaced. Expansion will resume when Array Accelerator RAM allocation is successful. Expansion will resume when Array Accelerator battery reaches full charge. Expansion will resume when automatic data recovery has been completed.			Reattach or replace Array Accelerator, wait until the Array Accelerator batteries have charged, or for Automatic Data Recovery to complete, as indicated.
1765-Slot x Drive Array Option ROM Appears to Conflict With an ISA Card. ISA cards with 16-bit memory cannot be configured in memory range C0000 to DFFFF along with the SMART-2/E 8-bit Option ROM due to EISA bus limitations. Please remove or reconfigure your ISA card.			Remove or reconfigure conflicting ISA cards. Disable "shared memory" on any ISA network cards that may be installed.
1766-Slot x Drive Array requires System ROM Upgrade. Run Systems ROMPaq Utility.			Run the latest Systems ROMPaq Utility to upgrade your System ROMs.

1767-Slot x Drive Array Option ROM is Not Programmed Correctly or may Conflict with the Memory Address Range of an ISA Card. Check the Memory Address Configuration of installed ISA Card(s) or run Options ROMPaq Utility to attempt SMART-2/E Option ROM Reprogramming.			Remove or reconfigure conflicting ISA cards, especially any cards that are not recognized by the System Configuration Utility. Try reprogramming the SMART-2/E Controller's ROMs using the latest Options ROMPaq (version 2.29 or higher).
1768-Slot x Drive Array -Resuming logical drive expansion process.	None	SMART-2 Controller error	No action required. Appears whenever a controller reset or power cycle occurs while array expansion is in progress.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1769-Slot x Drive Array - Drive(s) disabled due to failure during expand. Select **F1** to continue with logical drives disabled. Select **F2** to accept data loss and to re-enable logical drives.	None	SMART-2 Controller error.	Data has been lost while expanding the array, therefore the drives have been temporarily disabled. Press **F2** to accept the data loss and re-enable the logical drives. Restore data from backup.
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the System Configuration Utility and correct.
1773-Primary Fixed Disk Port Assignment Conflict	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1774-Slot x Drive Array - Obsolete data found in Array Accelerator. Select **F1** to discard contents of Array Accelerator. Select **F2** to write contents of Array Accelerator to drives.	None	SMART-2 Controller error.	Data found in Array Accelerator is older than data found on drives. Press **F1** to discard the older data in the Array Accelerator and retain the newer data on the drives.

1776-Drive Array - SCSI Port Termination Error	None	External and internal SCSI drives are both configured to Port 1.	Reconfigure drives.
1777-Drive Array External Drive Subsystem Error	None	Cooling fan failure, internal temperature alert or open side panel.	Inspect for cooling fan failure or open side panel.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1778-Drive Array resuming Automatic Data Recovery process	None	This message appears whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Drive Array Controller detects replacement drives	None	Intermittent drive failure and/or possible loss of data.	If this message appears and drive X has not been replaced, this indicates an intermittent drive failure. This message also appears once immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.
1781-Disk 1 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.
1782-Disk Controller Failure	None	Hard disk drive circuitry error.	Run Diagnostics. Replace failed assembly as indicated.
1784-Drive Array Drive Failure, Physical Drive	None	Defective drive and/or cables.	Check for loose cables. Replace defective drive X and/or cable(s).
1785-Drive Array not Configured	None	Configuration error.	Run the System Configuration Utility and correct.

1786-Drive Array Recovery Needed The following drive(s) need Automatic Data Recovery: Drive *X*. Select "F1" to continue with recovery of data to drive(s). Select "F2" to continue without recovery of data to drive(s).	None	Interim Data Recovery mode. Data has not been recovered yet.	Press **F1** key to allow Automatic Data Recovery to begin. Data will automatically be restored to drive *X* now that the drive has been replaced or now seems to be working. -Or- Press the **F2** key and the system will continue to operate in the Interim Data Recovery mode.

continued

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1787-Drive Array Operating in Interim Recovery Mode. Physical drive replacement needed: Drive *X*	None	Hard drive *X* failed or cable is loose or defective. Following a system restart, this message reminds you that drive *X* is defective and fault tolerance is being used.	1. Replace drive X as soon as possible. 2. Check loose cables. 3. Replace defective cables.
*1788-Incorrect Drive Replaced: Drive *X* Drive(s) were incorrectly replaced: Drive *Y* Select "F1" to continue - drive array will remain disabled. Select "F2" to reset configuration - all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.

*NOTE: The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive or by noise on the data cable. If this message was due to a bad power cable connection, but not because of an incorrect drive replacement, repair the connection and press **F2**.

-Or-

If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1789-Drive Not Responding, Physical Drive Check cables or replace physical drive *X*. Select "F1" to continue - drive array will remain disabled. Select "F2" to fail drive(s) that are not responding - Interim Recovery Mode will be enabled if configured for fault tolerance.	None	Cable or hard drive failure.	1. Check the cable connections. 2. If cables are connected, replace the drive. 3. If you do not want to replace the drives now, press **F2**.
1790-Disk 0 Configuration Error	None	Hard drive error or wrong drive type	Run the System Configuration Utility and Diagnostics and correct.
1791-Disk 1 Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Power was then restored within eight to ten days, and the data in the Array Accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1793-Drive Array - Array Accelerator Battery Depleted - Data Lost (Error message 1794 also displays.)	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Array Accelerator batteries failed. Data in Array Accelerator has been lost.	Power was not restored within eight to ten days. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.
1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	This is a warning that the battery charge is below 75%. Posted-writes are disabled.	Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.
1795-Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. The data stored in the Array Accelerator does not correspond to this drive array.	Match the Array Accelerator to the correct drive array, or run the System Configuration Utility to clear the data in the Array Accelerator.

1796-Drive Array - Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array Accelerator is defective or has been removed.	1. Check that the Array Accelerator is properly seated. 2. Run the System Configuration Utility to reconfigure the Compaq IDA-2 without the Array Accelerator.
1797-Drive Array - Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost. Array Accelerator is disabled.	None	Hard parity error while reading data from posted-writes memory.	Enable Array Accelerator.

POST Error Messages *continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1798-Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error while writing data to posted-writes memory.	Enable Array Accelerator.
1799-Drive Array - Drive(s) Disabled due to Array Accelerator Data Loss. Select "F1" to continue with logical drives disabled. Select "F2" to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press **F1** to continue with logical drives disabled or **F2** to accept data loss and re-enable logical drive.
Beeps only: 2 Long + 2 Short	2L, 2S	Power is cycled. Temperature too hot. Processor fan not installed or spinning.	Check fans.
(Run System Configuration Utility - **F10** key)	None	A configuration error occurred during POST.	Press **F10** to run System Configuration Utility.
(RESUME - **F1** KEY)	None	As indicated to continue.	Press the **F1** key.

Diagnostics Software

Tables 3-2 through 3-20 include all test error codes generated by Compaq products. Each code has a corresponding description and recommended action(s). Your system generates only those codes that are applicable to your configuration and options.

When you select Diagnostics and Utilities from the System Configuration Utility main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the system partition on the hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. You can create a Diagnostics diskette from the SmartStart CD and run Diagnostics from diskette.

The following options are available from the Diagnostics and Utilities menu:

■ Test Computer

■ Inspect Computer

■ Upgrade Firmware

■ Remote Utilities

■ Diagnose Drive Array

Diagnostic error codes are generated when the Diagnostics software recognizes a problem. These error codes, listed in tables 3-2 through 3-20, help identify possible defective subassemblies.

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the Diagnostics program again. Follow this procedure until the Diagnostics program no longer detects an error condition.

If you encounter an error condition, complete the following steps before starting problem isolation procedures:

1. Be certain proper ventilation exists. The computer should have approximately 12 inches (30.5 cm) clearance at the front and back of the system unit.

2. Turn off the computer and peripheral devices.

3. Disconnect any peripheral devices not required for testing. Do not disconnect the printer if you want to test it or use it to log error messages.

4. Turn on the computer.

5. Delete the power-on password, if set. You will know that the power-on password is set when a key icon appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password, a forward slash (/), and press the **Enter** key.

6. Disable the power-on password by using the Password Disable switch on the system board, if you do not have access to the password.

7. Install a loopback plug (Part Number 142054-001), when required by Diagnostics.

8. Run the latest version of Diagnostics.

Running Diagnostics

There are two ways to access the utilities:

■   From the System Partition.

■   From diskette. A diskette can be created from the SmartStart CD.

1. Accessing the utilities from the system partition:

2. Reboot the server by pressing the **Ctrl+Alt+Delete** keys.

Press **F10** when the following prompt appears at the top of the screen during POST.

> Press **"F10"** for System Partition Utilities.

IMPORTANT: The text appears for only two seconds. If you do not press **F10** during this time, you must reboot the server.

3. From the System Configuration Main Menu, select *Diagnostics and Utilities.*

If there are errors detected in your Server Health Log, the Diagnostics Utility automatically displays the following screen message:

> CAUTION: Errors have been detected in you
> Server Health Log. Diags will now identify your
> system hardware.

1. Press the **Enter** key to continue.

2. After a short pause, the Server Health Log menu displays with a list of system errors. If there is more than one error, press the Space Bar to select the error you want to correct. Press **Enter**.

3. The Diagnostics Utility prompts you and suggests corrective action.

Primary Processor Test Error Codes

The 100 series of Diagnostic error codes identifies failures with processor and system board functions. Corrective action may require replacement of system boards or processor assemblies (either processor boards or system boards that include the processor).

Table 3-2
Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed	Replace the processor board and retest.
103-xx	DMA page registers test failed.	For error codes 103-xx through 106-xx, replace the processor board and retest.
104-xx	Interrupt controller master test failed.	
105-xx	Port 61 error.	
106-xx	Keyboard controller self-test failed.	
107-xx	CMOS RAM test failed.	The following steps apply to error codes 107-xx through 109-xx:
108-xx	CMOS interrupt test failed.	1. Replace the battery/clock module and retest.
109-xx	CMOS clock load data test failed.	2. Replace the system board and retest.
110-xx	Programmable timer load data test failed.	For error codes 110-xx through 113-xx, replace the system board and retest.
111-xx	Refresh detect test failed.	
112-xx	Speed test slow mode out of range.	
113-xx	Protected mode test failed.	
114-xx	Speaker test failed.	1. Verify the speaker connection and retest.
		2. Replace the speaker and retest.
		3. Replace the system board and retest.
116-xx	Cache test failed.	Replace the system board and retest.
122-xx	Multiprocessor Dispatch test failed.	The following steps apply to error codes 122-xx through 123-xx:
123-xx	Interprocessor Communication test failed.	1. Check the system configuration and retest.
		2. Replace the processor board and retest.
		3. Replace the system board and retest.
199-xx	Installed devices test failed.	1. Check the system configuration and retest.
		2. Verify cable connections and retest.
		3. Check switch and/or jumper settings and retest.
		4. Run the Configuration utility and retest.
		5. Replace the processor board and retest.
		6. Replace the system board and retest.

Memory Test Error Codes

The 200 series of Diagnostic error codes identifies failures with the memory subsystem. Corrective action may require replacement of the memory expansion board, the memory modules, or the processor assembly.

Table 3-3
Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration.	Reinsert memory modules in correct location and retest.
201-xx 202-xx	Memory machine ID test failed. Memory system ROM checksum failed.	The following steps apply to error codes 201-xx and 202-xx: 1. Replace the system ROM and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
203-xx 204-xx 205-xx 206-xx	Memory write/read test failed. Memory address test failed. Walking I/O test failed. Increment pattern test failed.	The following steps apply to error codes 203-xx through 210-xx: 1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
207-xx	Invalid memory configuration-check DIMM installation. DIMMs installed have 8K refresh.	Replace DIMMs.
208-xx	Invalid memory speed detected - check DIMM installation. Slow DIMMs may cause data loss.	Replace DIMMs with timing greater than 60 ns.
210-xx	Random pattern test failed.	1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
215	Non-functioning DC-DC converter for processor X.	Replace the DC-DC converter(processor power module).

Keyboard Test Error Codes

The 300 series of Diagnostic error codes identifies failures with keyboard and system board functions. Corrective action may require replacement of a keyboard or the system board assembly.

Table 3-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed.	The following steps apply to error codes 301-xx
302-xx	Keyboard long test failed.	through 304-xx:
303-xx	Keyboard LED test, 8042 self-test failed.	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard and retest.
304-xx	Keyboard typematic test failed.	2. Replace the keyboard and retest.
		3. Replace the system board and retest.

Parallel Printer Test Error Codes

The 400 series of Diagnostic error codes identifies failures with parallel printer interface card or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected.	The following steps apply to error codes 401-xx
402-xx	Printer data register failed.	through 498-xx:
403-xx	Printer pattern test failed.	1. Connect the printer and retest.
498-xx	Printer failed or not connected.	2. Check the power to the printer and retest.
		3. Install the loopback connector and retest.
		4. Check the switch on the Serial/Parallel Interface board (if applicable) and retest.
		5. Replace the Serial/Parallel Interface board (if applicable) and retest.
		6. Replace the system board and retest.

Video Display Unit Test Error Codes

The 500 series of Diagnostic error codes identifies failures with video or system board functions. Corrective action may require replacement of a video board or the system board assembly.

Table 3-6
Video Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Video controller test failed.	The following steps apply to error codes 501-xx through 516-xx:
502-xx	Video memory test failed.	
503-xx	Video attribute test failed.	1. Replace the monitor and retest.
504-xx	Video character set test failed.	2. Replace the Advanced VGA board and retest.
505-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	
506-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	
507-xx	Video 40 x 25 mode test failed.	3. Replace the system board and retest.
508-xx	Video 320 x 200 mode color set 0 test failed.	
509-xx	Video 320 x 200 mode color set 1 test failed.	
510-xx	Video 640 x 200 mode test failed.	
511-xx	Video screen memory page test failed.	
512-xx	Video gray scale test failed.	
514-xx	Video white screen test failed.	
516-xx	Video noise pattern test failed.	

Diskette Drive Test Error Codes

The 600 series of Diagnostic error codes identifies failures with diskette, diskette drive, or system board functions. Corrective action may require replacement of a diskette, a diskette drive, or the system board assembly.

Table 3-7
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	The following steps apply to error codes 600-xx through 698-xx:
601-xx	Diskette format failed.	
602-xx	Diskette read test failed.	1. Replace the diskette and retest.
603-xx	Diskette write/read/compute test failed.	2. Check and/or replace the diskette power and signal cables and retest.
604-xx	Diskette random seek test failed.	
605-xx	Diskette ID media failed.	3. Replace the diskette drive and retest.
606-xx	Diskette speed test failed.	4. Replace the system board and retest.
607-xx	Diskette wrap test failed.	
608-xx	Diskette write protect test failed.	
609-xx	Diskette reset controller test failed.	
610-xx	Diskette change line test failed.	
694-xx	Pin 34 is not cut on 360 KB diskette drive.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media ID error.	1. Replace the media and retest.
		2. Run the Configuration utility and retest.

Monochrome Video Board Test Error Codes

The 800 series of Diagnostic error codes identifies failures with monochrome video boards or system board functions. Corrective action may require replacement of a monochrome video board or the system board assembly.

Table 3-8
Monochrome Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed.	The following steps apply to error codes 802-xx and 824-xx:
824-xx	Monochrome video text mode test failed.	1. Replace monitor and retest.
		2. Replace the Advanced VGA board and retest.
		3. Replace monochrome board and retest.
		4. Replace the system board and retest.

Serial Test Error Codes

The 1100 series of Diagnostic error codes identifies failures with serial/parallel interface board or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-9
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	The following steps apply to error codes 1101-xx and 1109-xx:
1109-xx	Clock register test failed.	
		1. Check the switch settings on the Serial/Parallel Interface board (if applicable) and retest.
		2. Replace the Serial/Parallel Interface board (if applicable) and retest.
		3. Replace the system board and retest.

Modem Communications Test Error Codes

The 1200 series of Diagnostic error codes identifies failures with the modem(s). Corrective action may require replacement of the modem(s).

Table 3-10
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed.	The following steps apply to error codes 1201-xx through 1210-xx:
1202-xx	Modem time-out test failed.	
1203-xx	Modem external termination test failed.	1. Refer to the modem documentation for correct setup procedures and retest.
1204-xx	Modem auto originate test failed.	
1206-xx	Dial multi-frequency tone test failed.	2. Check the modem line and retest.
1210-xx	Modem direct connect test failed.	3. Replace the modem and retest.

Fixed Disk Drive Test Error Codes

The 1700 series of Diagnostic error codes identifies failures with fixed disk drives, fixed disk drive controller boards, fixed disk drive cabling, and system board functions. Corrective action may require replacement of fixed disk drive cables, fixed disk drive controller boards, fixed disks, or the system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-11
Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Fixed disk ID drive types test failed.	The following steps apply to error codes 1700-xx through 1799-xx:
1701-xx	Fixed disk format test failed.	
1702-xx	Fixed disk read test failed.	
1703-xx	Fixed disk write/read/compare test failed.	
1704-xx	Fixed disk random seek test failed.	1. Run the System Configuration Utility and verify the drive type.
1705-xx	Fixed disk controller test failed.	
1708-xx	Fixed disk format bad track test failed.	2. Replace the fixed disk drive signal and power cables and retest.
1709-xx	Fixed disk reset controller test failed.	
1710-xx	Fixed disk park head test failed.	
1715-xx	Fixed disk head select test failed.	3. Replace the fixed disk drive controller and retest.
1716-xx	Fixed disk conditional format test failed.	
1717-xx	Fixed disk ECC* test failed.	
1719-xx	Fixed disk drive power mode test failed.	4. Replace the fixed disk drive and retest.
1736-xx	Drive Monitoring failed.	5. Replace the system board and retest.
1799-xx	Invalid fixed disk drive type failed.	
* Error Checking and Correcting		

Tape Drive Test Error Codes

The 1900 series of Diagnostic error codes identifies failures with tape cartridges, tape drives, tape drive cabling, adapter boards, or the system board assembly. Corrective action may require replacement of tape cartridges, tape drive cabling, adapter boards, tape drives, or the system board assembly.

Table 3-12
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed.	The following steps apply to error codes 1900-xx through 1906-xx:
1901-xx	Tape servo write failed.	
1902-xx	Tape format failed.	1. Replace the tape cartridge and retest.
1903-xx	Tape drive sensor test failed.	2. Check and/or replace the signal cable and retest.
1904-xx	Tape BOT/EOT test failed.	3. Check the switch settings on the adapter board (if applicable).
1905-xx	Tape read test failed.	
1906-xx	Tape write/read/compare test failed.	4. Replace the tape adapter board (if applicable) and retest.
		5. Replace the tape drive and retest.
		6. Replace the system board and retest.

Advanced VGA Board Test Error Codes

The 2400 series of Diagnostic error codes identifies failures with video boards, monitors, or the system board assembly. Corrective action may require replacement of a monitor, video boards, or the system board assembly.

Table 3-13
Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed.	The following steps apply to error codes 2402-xx through 2456-xx:
2403-xx	Video attribute test failed.	1. Run the System Configuration Utility.
2404-xx	Video character set test failed.	2. Replace the monitor and retest.
2405-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	3. Replace the Advanced VGA board or other video board and retest.
2406-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	4. Replace the system board and retest.
2407-xx	Video 40 x 25 mode test failed.	
2408-xx	Video 320 x 320 mode color set 0 test failed.	
2409-xx	Video 320 x 320 mode color set 1 test failed.	
2410-xx	Video 640 x 200 mode test failed.	
2411-xx	Video screen memory page test failed.	
2412-xx	Video gray scale test failed.	
2414-xx	Video white screen test failed.	
2416-xx	Video noise pattern test failed.	
2417-xx	Lightpen text mode test failed, no response.	
2418-xx	ECG/VGC memory test failed.	

Advanced VGA Board Test Error Codes continued

Error Code	Description	Recommended Action
2419-xx	ECG/VGC ROM checksum test failed.	
2420-xx	ECG/VGC attribute test failed.	
2421-xx	ECG/VGC 640 x 200 graphics mode test failed.	
2422-xx		
2423-xx	ECG/VGC 640 x 350 16-color set test failed.	
2424-xx	ECG/VGC 640 x 350 64-color test failed.	
2425-xx	ECG/VGC monochrome text mode test failed.	
2431-xx	ECG/VGC monochrome graphics mode test failed.	
2432-xx		
2448-xx	640 x 480 graphics test failure.	
2451-xx	320 x 200 graphics (256-color mode) test failure.	
2456-xx		
2458-xx	Advanced VGA Controller test failed.	The following steps apply to error codes 2458-xx through 2480-xx:
2468-xx	132-column Advanced VGA test failed.	1. Run Setup.
2477-xx	Advanced VGA 256-Color test failed.	2. Replace the system board and retest.
2480-xx	Advanced VGA Bit BLT Test.	
	Advanced VGA DAC Test.	
	Advanced VGA Data Path Test.	
	Advanced VGA DAC Test.	

32-Bit DualSpeed NetFlex-2 Controller and 32-Bit DualSpeed NetFlex-2 Token Ring Controller
Test Error Codes

The 6000 series of Diagnostic error codes identifies failures with 32-bit DualSpeed NetFlex-2/Token Ring Controllers. Corrective action may require replacement of the 32-bit DualSpeed NetFlex-2/Token Ring Controller.

Table 3-14
32-Bit DualSpeed NetFlex-2 Controller and
32-Bit DualSpeed NetFlex-2 Token Ring Controller
Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed	The following steps apply to error codes 6000-xx through 6089-xx:
6001-xx	Network card setup failed	
6002-xx	Network card transmit failed	1. Check the controller installation in the EISA slot.
6014-xx	Network card Configuration failed	2. Check the interrupt type and number setting.
6016-xx	Network card Reset failed	
6028-xx	Network card Internal failed	3. Check the media connection at the controller and Multistation Access Unit (MAU).
6029-xx	Network card External failed	
6089-xx	Network card Open failed	4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings.
		5. Check the MAU, cabling, or other network components.
		6. Replace the controller.

Compaq Network Interface Cards
Test Error Codes

The 6000 series of Diagnostic error codes identifies failures with Compaq Network
Interface Cards.

Table 3-15
Compaq Network Interface Cards
Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed.	The following steps apply to error codes 6000-xx through 6092-xx:
6001-xx	Network card setup failed.	
6002-xx	Network card transmit failed.	1. Check the controller installation in the EISA slot.
6014-xx	Network card configuration failed.	
6016-xx	Network card reset failed.	2. Check the interrupt type and number setting.
6028-xx	Network card internal failed.	
6029-xx	Network card external failed.	3. Check the media connection at the controller and Multistation Access Unit (MAU).
6089-xx	Network card open failed.	
6090-xx	Network card initialization failed.	4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings.
6091-xx	Network card internal loopback failed.	
6092-xx	Network card external loopback failed.	5. Check the MAU, cabling, or other network components.
		6. Replace the controller.

SCSI Fixed Disk Drive Test Error Codes

The 6500 series of Diagnostic error codes identifies failures with SCSI fixed disk drives, SCSI fixed disk drive controller boards, SCSI fixed disk drive cabling, and system board functions. Corrective action may require replacement of fixed disk drive cables, fixed disk drive controllers, fixed disks, or the system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-16
SCSI Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
6500-xx	SCSI Disk ID drive types test failed.	The following steps apply to error codes 6500-xx through 6528-xx:
6502-xx	SCSI Disk Unconditional Format test failed.	
6505-xx		
6506-xx	SCSI Disk Read Test Failed.	1. Run the System Configuration Utility and verify the drive type.
6509-xx	SCSI Disk SA/Media test failed.	2. Replace the SCSI disk drive signal and power cables and retest.
6523-xx	SCSI Disk Erase tape test failed.	3. Replace the SCSI controller and retest.
6528-xx	SCSI Disk Random Read test failed. Media load/unload test failed.	4. Replace the SCSI disk drive and retest.
		5. Replace the system board and retest.

SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of Diagnostic error codes identifies failures with the CD-ROM cabling, CD-ROM drives, adapter boards, or the system board assembly. Corrective action may require replacement of the CD-ROM cabling, a CD-ROM drive, an adapter board, or the system board assembly.

Table 3-17
SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed.	The following steps apply to error codes 6600-xx through 6605-xx:
6605-xx	CD-ROM Read failed.	1. Replace the CD-ROM media and retest.
		2. Check and/or replace the signal cable and retest.
		3. Check the switch settings on the adapter board (if applicable).
		4. Replace the SCSI controller (if applicable) and retest.
		5. Replace the CD-ROM drive and retest.
		6. Replace the system board and retest.

SCSI Tape Drive Test Error Codes

The 6700 series of Diagnostic error codes identifies failures with tape cartridges, tape drives, media changers, tape drive cabling, adapter boards, or the system board assembly. Corrective action may require replacement of a tape cartridge, tape drive, media changer, tape drive cabling, adapter board, or the system board assembly.

Table 3-18
SCSI Tape Drive Test Error Codes

Error Code	Description	Recommended Action
6700-xx	SCSI Tape ID drive types test failed.	The following steps apply to error codes 6700-xx through 6728-xx:
6706-xx	SCSI Disk SA/Media test failed.	
6709-xx	SCSI Disk Erase tape test failed.	1. Run the System Configuration Utility and verify the drive type.
6728-xx	Media load/unload test failed.	2. Replace the SCSI Tape drive signal and power cables and retest.
		3. Replace the SCSI controller and retest.
		4. Replace the SCSI Tape drive and retest.
		5. Replace the system board and retest.

Server Manager/R Board Test Error Codes

The 7000 series of Diagnostic error codes identifies failures with the Server Manager/R board. Corrective action may require replacement of the Server Manager/R board, the Integrated 2400-baud modem, voice ROM, or the battery on the Server Manager/R board.

Table 3-19
Server Manager/R Board Test Error Codes

Error Code	Description	Recommended Action
7000-11	Processor (80186 Timer).	For error codes 7000-11 through 7000-46, replace the Server Manager/R board and retest.
7000-12	Processor (80186 Registers).	
7000-13	Processor (Watch Dog Timer).	
7000-14	Processor (8570 RAM).	
7000-15	Processor (8570 RTC).	
7000-21	Memory.	
7000-22	Memory Write/Read.	
7000-23	Memory Address.	
7000-24	Memory Refresh Alert.	

Server Manager/R Board Test Error Codes *continued*

Error Code	Description	Recommended Action
7000-25	Memory Increment	
7000-26	Memory Random Data.	
7000-27	Memory Disturb Address.	
7000-28	Memory HBM.	
7000-33	HBM IO.	
7000-34	HBM BMIC.	
7000-35	HBM Video.	
7000-41	ser_int.	
7000-42	ser_int.	
7000-43	ser_ext.	
7000-44	ser_ext.	
7000-45	ser_ext_int.	
7000-46	ser_ext_int.	
7000-51	mdm_int.	For error codes 7000-51 through 7000-57, replace the Server Manager/R board Enhanced 2400-Baud Integrated Modem and retest.
7000-52	mdm_int.	
7000-53	mdm_ext.	
7000-54	mdm_ext.	
7000-55	mdm_ext_int.	
7000-56	mdm_ext_int.	
7000-57	mdm\c\analog.	
7000-61	Voice/DTMF Internal Loopback.	For 7000-61 and 7000-62 error codes, replace the Server Manager/R board Voice ROM.
7000-62	Voice/DTMF Internal Loopback.	
7000-78	Host ADC Measurements.	For 7000-78 and 7000-79 error codes, replace the Server Manager/R board battery.
7000-79	Battery.	

Pointing Device Interface Test Error Codes

The 8600 Diagnostic error codes identifies failures with the pointing device (mouse, trackball, etc.) or the system board assembly. Corrective action may require replacement of the pointing device or the system board assembly.

Table 3-20
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing Device Interface test failed.	The following steps apply for the 8601-xx error code: 1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

Drive Array Advanced Diagnostics (DAAD)

Drive Array Advanced Diagnostics (DAAD) is a DOS-based tool designed to run on all Compaq products that contain a Compaq Drive Array Controller. The error messages and codes listed include all codes generated by Compaq products. Your system generates only codes applicable to your configuration and options.

The two main functions of DAAD are:

■ Collecting all possible information about array controllers in the system

■ Offering a list of all detected problems

NOTE**: Refer to the *Drive Array Advanced Diagnostics User Guide,* found on the SmartStart CD, for complete details and procedures about this diagnostic tool.**

DAAD works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file and, in severe situations, this file can be sent to Compaq for analysis. In most cases, DAAD will provide enough information to initiate problem resolution immediately.

NOTE**: DAAD does not write to the drives or destroy data. It does not change or remove configuration information.**

Starting DAAD

To start DAAD:

1. Insert the DAAD diskette into drive A.

2. Reboot the system - OR - if you are at the DOS prompt, enter the following:

   A:DAAD

   NOTE**: To generate a DAAD report without starting the interactive portion of the utility, enter the following at the DOS prompt:
   DAAD *filename*
   where *filename* is the name of the file or report.**

A dialog box is displayed, indicating the version of DAAD installed. Press the **Enter** (or '**C**') key to continue, or press the **Esc** (or '**E**') key to exit without continuing.

1. If you continue, a Please Wait panel is displayed, indicating that DAAD is identifying the system parameters.

   DAAD gathers all the information it can from all of the array controllers in the system. The time it takes to gather this information depends on the size of your system.

   A second Please Wait panel may be displayed to indicate that the utility is identifying the ROM version of an array controller in the system.

   ⚠ **CAUTION:** Do not cycle the power; the utility must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

When the information gathering process is complete, the main DAAD screen is displayed.

Table 3-21 lists DAAD diagnostic messages in alphabetical order.

Table 3-21
DAAD Diagnostic Messages

Message	Description	Recommended Action
Accelerator board not detected	Array controller did not detect a configured array accelerator board.	Install array accelerator board on array controller. If an array accelerator board is installed, check for proper seating on the array controller board. You may need to run the System Configuration Utility and disable the array accelerator board to get this message off the screen.
Accelerator error log	List of the last 32 parity errors on transfers to or from memory on the array accelerator board. Displays starting memory address, transfer count, and operation (read and write).	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity read errors: n	Number of times that read memory parity errors were detected during transfers from memory on array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity write errors: n	Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator status: Permanently disabled	Array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the System Configuration Utility.	Check the Disable Code field. Run the System Configuration Utility to reinitialize the array accelerator board.
Accelerator status: Possible data loss in cache	Possible data loss detected during power-up due to all batteries being below sufficient voltage level and no presence of the identification signatures on the array accelerator board.	There is no way to determine if dirty or bad data was in the cache and is now lost.
Accelerator status: Temporarily disabled	Array accelerator board has been temporarily disabled.	Check the Disable Code field.

Accelerator status: Unrecognized status	A status returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.

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DAAD Diagnostic Messages *continued*

Message	Description	Recommended Action
Accelerator status: Obsolete data sensed at reset	During reset initialization obsolete data was found in the cache. This was due to the drives being moved and written to by another controller.	Nothing needs to be done. The controller will either write the data to the drivers or discard the data completely. Normal operations should continue.
Accelerator status: Obsolete data was written to drives	During reset initialization obsolete data was found in the cache. The obsolete data was written to the drives, but newer data may have been overwritten.	If newer data was overwritten, you may need to restore newer data; otherwise, nothing needs to be done. Normal operations should continue.
Accelerator status: Obsolete data was discarded	During reset initialization obsolete data was found in the cache and it was discarded (not written to the drives).	Nothing needs to be done. Normal operations should continue.
Accelerator status: Dirty data detected. Unable to write dirty data to drives	At least one cache line contains dirty data that the controller has been unable to flush (write) to the drives. This problem usually occurs when there is a problem with the drive(s).	Fix the problem with the drive(s). Then the controller will be able to write the dirty data to the drives.
Accelerator status: Dirty data detected has reached limit. Cache still enabled, but writes no longer being posted	The number of cache lines containing dirty data that cannot be flushed (written) to the drives has reached a preset limit. The cache is still enabled, but writes are no longer being posted. This problem usually occurs when there is a problem with the drive(s).	Fix the problem with the drive(s). Then the controller will be able to write the dirty data to the drives and posted write operations will be restored.
Accelerator status: Excessive ECC errors detected in at least one cache line. As a result, at least on cache line is no longer in use.	At least on line in the cache is no longer in use due to excessive ECC errors detected during use of the memory associated with that cache line.	Replacement of the cache should be considered. If cache replacement is not done the remaining cache lines should continue to operate properly.
Accelerator status: Data in the cache was	Data in the cache was lost, but not because of the battery being	Check to be sure that the array accelerator is properly seated. If the error continues you may need to replace the array

lost due to some reason other than the battery being discharged	discharged.	accelerator.

DAAD Diagnostic Messages *continued*

Message	Description	Recommended Action
Accelerator status: Cache was automatically configured during last controller reset. This can occur when cacheboard is replaced with one of a different size.	Cache board was probably replaced with one of a different size.	Nothing needs to be done. Normal operations should continue.
Accelerator status: Valid data found at reset	Valid data was found in posted write memory at reinitialization. Data will be flushed to disk.	Not an error or data loss condition. No action needs to be taken.
Accelerator status: Warranty alert	Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message.	Replace the array accelerator board.
Adapter/NVRAM ID mismatch	EISA nonvolatile RAM has an ID for a different controller from the one physically present in the slot.	Run the System Configuration Utility.
Battery pack X below reference voltage	Battery pack on the array accelerator is below the required voltage levels.	Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Battery X not fully charged	Battery is not fully charged.	If 75% of the batteries present are fully charged, the array accelerator is fully operational. If more than 75% of the batteries are **not** fully charged, allow 36 hours to recharge them.
Board not attached	Array controller configured for use with array accelerator board, but one is not attached.	Attach array accelerator board to array controller.
NVRAM configuration present, controller not detected	EISA nonvolatile RAM has a configuration for an array controller but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.	Place the array controller in the proper slot or run the System Configuration Utility to reconfigure nonvolatile RAM to reflect the removal or new position.

Compatibility port problem detected	Compatibility port configured for this IDA controller. When DAAD was verifying this interface, a serious problem was detected.	A hardware problem has occurred; replace the IDA controller.

DAAD Diagnostic Messages   *continued*

Message	Description	Recommended Action
Configuration signature is zero	DAAD detected that nonvolatile RAM contains a configuration signature that is zero. Old versions of the System Configuration Utility could cause this.	Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.
Configuration signature mismatch	Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board.	To recognize the array accelerator board, run the System Configuration Utility.
Controller communication failure occurred	Controller communication failure occurred.	DAAD was unable to successfully issue commands to the controller in this slot.
Controller detected. NVRAM configuration not present	EISA nonvolatile RAM does not contain a configuration for this controller.	Run the System Configuration Utility to configure the nonvolatile RAM.
Controller firmware needs upgrading	Controller firmware is below the latest recommended version.	Run Options ROMPaq to upgrade the controller to the latest firmware revision.
Controller firmware needs upgrading (DAAD Error 102)	Controller is correct, however, IDA firmware version should be greater than 1.26.	Obtain the latest firmware.
Controller is located in special "video" slot	Controller is installed in slot for special video control signals. If controller is used in this slot, LED indicators on front panel may not function properly.	Install the controller in a different slot and run the System Configuration Utility to configure the controller and nonvolatile RAM.
Controller is not configured	Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. DAAD examines each physical drive and looks for drives that have	Look for messages indicating which drives have been moved. If none appear and drive swapping did not occur, run the System Configuration Utility to configure the controller and nonvolatile RAM. **Do not** run the System Configuration Utility if you believe drive swapping

	been moved to a different drive bay.	has occurred.
Controller needs replacing (DAAD Error 102)	IDA firmware is less than version 0.96.	Replace the controller as soon as possible.

DAAD Diagnostic Messages continued

Message	Description	Recommended Action
Controller needs replacing (DAAD Error 104)	The Intelligent Array Expansion System firmware is less than version 1.14.	Replace the controller as soon as possible.
Controller reported POST error. Error Code: x	The controller returned an error from its internal Power-On Self Tests.	Replace the controller.
Controller restarted with a signature of zero	DAAD did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
DAAD recorded errors attempting to access: X	DAAD found errors while attempting to access physical drive X, believed to be operational. Message followed by specific information about the error.	Replace the drive, or correct the condition that caused the error.
Disable command issued	Posted-writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.	Restart the system. Run the System Configuration Utility to reinitialize the array accelerator board.
Drive (bay) X needs replacing (DAAD Error 102)	The 210-megabyte hard drive has firmware version 2.30 or 2.31.	Replace the drive.
Drive Monitoring features are unobtainable	DAAD unable to get monitor and performance data due to fatal command problem such as drive time-out, or unable to get data due to these features not supported on the controller.	Check for other errors (time-outs, etc.). If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired.
Drive Monitoring is NOT enabled	The monitor and performance features have not been enabled.	Run the System Configuration Utility to initialize the monitor and performance features.

for drive bay X		
Drive time-out occurred on physical drive bay X	DAAD issued a command to a physical drive and the command was never acknowledged.	The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.

DAAD Diagnostic Messages *continued*

Message	Description	Recommended Action
Drive (bay) X firmware needs upgrading	Firmware on this physical drive is below the latest recommended version.	Run the Options ROMPaq Utility to upgrade the drive firmware to the latest revision.
Drive (bay) X has invalid M&P stamp	Physical drive has invalid monitor and performance data.	Run the System Configuration Utility to properly initialize this drive.
Drive X indicates position Y	Message indicates which physical drive appears to be scrambled or in a drive bay other than the one for which it was originally configured.	Examine the graphical drive representation on DAAD to determine proper drive locations. Remove drive X and place it in drive position Y. Rearrange the drives according to the DAAD instructions.
Drive (bay) X RIS copy mismatch	The copies of the RIS on this drive do not match.	This drive may need to be replaced. Check for other errors.
Drive (bay) X upload code not readable	An error occurred while DAAD was trying to read the upload code information from this drive.	If there were multiple errors, this drive may need to be replaced.
Drive (bay) X has loose cable	The array controller could not communicate with this drive at power-up. This drive has not previously failed.	Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect data/power cable to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.
Drive (bay) X is a replacement drive	This drive has been replaced. This message displays if a drive is replaced in a fault tolerant logical volume.	If the replacement was intentional, allow the drive to rebuild.
Drive (bay) X is a replacement drive marked OK	This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when DAAD is run, the drive starts working again).	Replace the drive.
Drive (bay) X is failed	The indicated physical drive has failed.	Replace this drive.
Drive (bay) X has insufficient capacity for its configuration	Drive has insufficient capacity to be used in this logical drive configuration.	Replace this drive with a larger capacity drive.

| Drive (bay) X is undergoing drive recovery | This drive is being rebuilt from the corresponding mirror or parity data. | Normal operations should occur. |

continued

DAAD Diagnostic Messages continued

Message	Description	Recommended Action
Drive (bay) X was inadvertently replaced	The physical drive was incorrectly replaced after another drive failed.	Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the System Configuration Utility and try to reconfigure; data will be lost.
Duplicate write memory error	Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. This is not a data loss situation.	Replace the array accelerator board.
Error occurred reading RIS copy from drive (bay) X	An error occurred while DAAD was trying to read the RIS from this drive.	If there were multiple errors, this drive may need to be replaced.
FYI: Drive (bay) X is non-Compaq supplied	The installed drive was not supplied by Compaq.	If problems exist with this drive, replace it with a Compaq drive.
Identify controller data did not match with NVRAM	The identify controller data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. It could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.	Check the identify controller data under the Inspect Utility. If the firmware version field is the only thing different between the controller and nonvolatile RAM data, this is not a problem. Otherwise, run the System Configuration Utility.
Identify logical drive data did not match with NVRAM	The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
Insufficient adapter resources	The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild	Operate the system without the array accelerator board until the drive rebuild completes.

	may be occurring.	
Less than 75% batteries at sufficient voltage	The operation of the array accelerator board has been disabled due to less than 75% of the battery packs being at the sufficient voltage level.	Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the array accelerator board.

continued

DAAD Diagnostic Messages *continued*

Message	Description	Recommended Action
Logical drive X failed due to cache error	This logical drive failed due to a catastrophic cache error.	Replace the array accelerator board and reconfigure using the System Configuration Utility.
Logical Drive X status = FAILED	This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status will occur. If mirroring is enabled, and any two mirrored drives fail, this status will occur. If Data Guarding is enabled, and two or more drives fail in this unit, this status will occur. This status may also occur if another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state.	Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s) and then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.
Logical Drive X status = INTERIM RECOVERY	A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable.	Replace the failed drive as soon as possible.
Logical Drive X status = LOOSE CABLE DETECTED	A physical drive has a cabling problem.	Turn the system off and attempt to reattach the cable onto the drive. If this does not work, replace the cable.
Logical Drive X status = NEEDS RECOVER	A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.	When booting up the system, select the "F1 - rebuild drive" option to rebuild the replaced drive.
Logical Drive X status = OVERHEATED	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels and it has shut down to avoid damage.	Check the fans and the operating environment.
Logical Drive X status = OVERHEATING	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels.	Check the fans and the operating environment.
Logical Drive X	A physical drive in this logical	Nothing needs to be done. Normal operations

| status =
RECOVERING | drive has failed and has now
been replaced. The replaced
drive is rebuilding from the mirror
drive or the parity data. | can occur. |

DAAD Diagnostic Messages continued

Message	Description	Recommended Action
Logical Drive X status = WRONG DRIVE REPLACED	A physical drive in this logical drive has failed. The incorrect drive was replaced.	Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the System Configuration Utility to reconfigure; you will lose data on the drive.
Loose cable detected - logical drives may be marked FAILED until corrected	Controller unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller.	Check all controller and drive cable connections.
Mirror data miscompare	Data was found at reinitialization in the posted write memory; however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.	Replace the array accelerator board.
Mirrored memory location errors	Soft errors occurred when attempting to read the same data from both sides of the mirrored memory. Data loss will occur.	Replace the array accelerator board.
No configuration for Accelerator Board	The array accelerator board has not been configured.	If the array accelerator board is present, run the System Configuration Utility to configure the board, if desired.
SCSI port X, drive ID Y firmware needs upgrading	Drive's firmware may cause problems and should be upgraded.	Run Options ROMPaq to upgrade the drive's firmware to a later revision.
Set configuration command issued	The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized.	Run the System Configuration Utility to reinitialize the array accelerator board.
Soft Firmware Upgrade required	DAAD has determined that your controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility.	Run the Compaq Upgrade Utility to place the latest firmware on all drives.

	However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.	
Threshold for drive (bay) X violated	This message indicates that a monitor and performance threshold for this drive has been violated.	Check for the particular threshold that has been violated.

DAAD Diagnostic Messages *continued*

Message	Description	Recommended Action
Threshold violations for drive (bay) X	This is a list of the individual thresholds that have been violated for this drive.	The drive may need to be replaced. Run the Compaq Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.
Unknown disable code	A code was returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.
Warning bit detected	A monitor and performance threshold violation may have occurred. The status of a logical drive may not be OK.	Check the other error messages for an indication of the problem.
WARNING - Drive Write Cache is enabled on X	Drive has its internal write cache enabled. The drive may be a third-party drive or the drive's operating parameters may have been altered. Condition may cause data corruption if power to the drive is interrupted.	Replace the drive with a Compaq supplied drive, or restore the drive's operating parameters.
Wrong Accelerator	This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by DAAD and a message indicating the type of adapter last configured in EISA nonvolatile RAM.	Check the diagnosis screen for other error messages. Run the System Configuration Utility to update the system configuration.

Integrated Management Log

On servers supporting the Integrated Management Display, Compaq Integrated Management Log (IML) replaces the Critical Error Log and Correctable Memory Logs. It records system events and stores them in an easily viewable form. It marks each event with a time-stamp with one-minute granularity.

Events listed in the Integrated Management Log are categorized as one of four event severity levels:

■   Status - indicates that the message is informational only.

■   Repaired - indicates that corrective action has been taken.

■   Caution - indicates a non-fatal error condition.

■   Critical - indicates a component failure.

The Integrated Management Log requires Compaq Operating System-dependent drivers. Refer to the Compaq Support Software CD for instructions on installing the appropriate drivers.

Multiple Ways of Viewing the Log

You can view an event in the IML in several ways:

■   On the Integrated Management Display

■   From within Compaq Insight Manager

■   From within Compaq Survey Utility

■   From within IML Management Utility

Integrated Management Display

The Integrated Management Display is a Liquid Crystal Display (LCD) panel that presents information directly at the server, assisting in diagnosing and servicing the server without a keyboard and monitor.

Compaq Insight Manager

Compaq Insight Manager is a server management tool providing in-depth fault configuration and performance monitoring of hundreds of Compaq servers from a single management console. System parameters that are monitored describe the status of all key server components. By being able to view the events that may occur to these components, you can take immediate action. You can view and print the event list from within Compaq Insight Manager by following the instructions that follow. You can also mark a critical or caution event as repaired after the affected component has been replaced. For example, when a fan that has failed has been replaced. By marking as repaired, you can lower the severity of the event.

Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server, then select View Device Data. The selected server is displayed with buttons around its perimeter.

2. Select the Recovery button.

3. Select Integrated Management Log.

4. If a failed component has been replaced, select the event from the list, then select Mark Repaired.

Printing the Event List

> NOTE**: You can only view the list from the Recovery/Integrated Management Log screen as described above.**

1. From the Insight Manager, select the appropriate server.

2. Select the Configuration button.

3. Select the Recovery button.

4. Select Print.

Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available from Windows NT and Novell NetWare that delivers online-configuration capture and comparison to maximize server availability. It is delivered on the Compaq Management CD in the SmartStart package or is available on the Compaq website. Refer to the Compaq Management CD for information on installing and running the Compaq Survey Utility.

After running the Compaq Survey Utility, you can view the IML by loading the output of the utility (typically called "survey.txt") into a text viewer such as Notepad. The event list follows the system slot information. Once you have opened the text file, you can print it using the print feature of the viewer.

Compaq IML Management Utility

The Compaq IML Management Utility is a DOS-based tool that gives you the off-line ability to review, mark corrected, and print events from the IML. It is located on the Compaq SmartStart and Support Software CD. Refer to the *SmartStart Installation for Servers* poster, which ships with the server, for information on how to install and use the IML Management Utility.

List of Events

The event list displays the affected components and the associated error messages. Though the same basic information is displayed, the format of the list may be different, depending on how you are viewing it: on the Integrated Management Display, from within Compaq Insight Manager, the IML management utility, or from within the Compaq Survey Utility. An example of the format of an event as displayed on the Integrated Management Display is as follows:

```
**001 of 010**
---caution---
03/19/1997
12:54 PM
FAN INSERTED
Main System
Location:
  System Board
Fan ID: 03
**END OF EVENT**
```

Table 3-22
Event Messages

Event Type	Event Message
Machine Environment	
Fan Failure	System Fan Failure (Fan X, Location)
Fan Inserted	System Fan Inserted (Fan X, Location)
Fan Removed	System Fan Removed (Fan X, Location)
Fans Not Redundant	System Fans Not Redundant
Overheat Condition	System Overheating (Zone X, Location)
Main Memory	
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X)
	Corrected Memory Error threshold passed (System Memory)
Uncorrectable Error	Corrected Memory Error threshold passed (Memory Module unknown)
	Uncorrectable Memory Error (Slot X, Memory Module X)
	Uncorrectable Memory Error (System Memory)
	Uncorrectable Memory Error (Memory Module unknown)

continued

Event Messages *continued*

Event Type	Event Message
Processor	
Correctable Error Threshold exceeded	Processor Correctable error Threshold passed (Slot X, Socket X)
	Processor Uncorrectable internal error (Slot X, Socket X)
Uncorrectable Error	Unrecoverable Host Bus Data Parity Error
Host Bus Error	Unrecoverable Host Bus Address Parity Error
EISA Bus	EISA Expansion Bus Master Timeout (Slot X)
	EISA Expansion Bus Slave Timeout
	EISA Expansion Board Error (Slot X)
	EISA Expansion Bus Arbitration Error
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X)
Power Subsystem	
Power Supply Failure	System Power Supply Failure (Power Supply X)
Power Supply Inserted	System Power Supply Inserted (Power Supply X)
Power Supply Removed	System Power Supply Removed (Power Supply X)
Power Supply Not Redundant	System Power Supplies Hot Redundant
	Real-Time Clock Battery Failing
System Configuration Battery Low	A CPU Power Module (System Board, Socket X)
Power Module Failure	A CPU Power Module (Slot X, Socket X)
	System Power Modules Not Redundant
Power Modules Not Redundant	System AC Power Problem (Power Supply X)
	System AC Power Overload (Power Supply X)
AC Voltage Problem	
Power AC Overload	
Automatic Server Recovery	
System Lockup	ASR Lockup Detected: Cause
Operating System	
System Crash	Blue Screen Trap: Cause [NT]
	Kernel Panic: Cause [UNIX]
	Abnormal Program Termination: Cause [NetWare]
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure

Automatic Operating System Shutdown Initiated Due to Overheat
Condition

Fatal Exception (Number X, Cause)

Rapid Recovery Services

Compaq servers provide rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery.

Rapid recovery means fast identification and resolution of complex faults. The Rapid Recovery Engine and Insight Management Agents notify the system administrator when a failure occurs, ensuring that the server experiences minimal downtime. You enable these features through the System Configuration Utility. These integrated server management features are:

■   Automatic Server Recovery-2 (ASR-2)

■   Server Health Logs (on servers not supporting Integrated Management Logs)

■   Storage Fault Recovery Tracking

■   Storage Automatic Reconstruction

■   Network Interface Fault Recovery Tracking

■   Memory Fault Recovery Tracking (with option upgrade kit)

These are discussed in more detail on the Systems Reference Library CD (SRL).

Automatic Server Recovery-2

Automatic Server Recovery-2 (ASR-2) lets the server restart automatically from the operating system or the Compaq Utilities. To use this feature, you must use the System Configuration Utility to install Compaq Utilities in the system partition.

You can tell ASR-2 to restart your server after a critical hardware or software error occurs. Using the Compaq System Configuration Utility, configure the system for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

You can also configure ASR-2 to page an administrator when the system restarts. ASR-2 depends on the application and driver that routinely notify the ASR-2 hardware of proper system operations. If the time between ASR-2 notifications exceeds the specified period, ASR-2 assumes a fault has occurred and initiates the recovery process.

To configure ASR-2:

1.   Execute the System Configuration Utility.

2.   Select *View and Edit Details*.

3.   Set the software error recovery status to Enabled.

4.   Set the software error recovery time-out.

The available recovery features are:

■ **Software Error Recovery** – automatically restarts the server after a software-induced server failure

■ **Environmental Recovery** – allows the server to restart when temperature, fan, or AC power conditions return to normal

Unattended Recovery

For unattended recovery, ASR-2 performs the following actions:

■ Logs the error information to the IML

■ Resets the server

■ Pages you (if a modem is present and you selected paging)

■ Tries to restart the operating system. Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available.

ASR-2 tries to restart the server up to 10 times. If ASR-2 cannot restart the server within 10 attempts, it places a critical error in the Integrated Management Log, starts the server into Compaq Utilities, and enables remote access (if you configured remote access).

To use this level of ASR-2, you must configure ASR-2 to load the operating system after restart.

Attended Recovery

For attended recovery, ASR-2 performs the following actions:

■ Logs the error information to the IML

■ Resets the server

■ Pages you (if a modem is present and you selected Paging)

■ Starts Compaq Utilities from the hard drive

■ Enables remote access

During system configuration, these utilities are placed on the system utilities partition of the hard drive.

If you have configured for dial-in access and have a modem with an auto-answer feature installed, you can dial in and remotely diagnose or reconfigure the server.

If you have configured the Compaq Utilities for network access, you can access the utilities over the network. You can use Compaq Insight Manager for dial-in or network access.

Hardware Requirements

To use this level of ASR-2 over a modem, you need the following:

■ Compaq modem or optional Hayes modem

■ System Configuration Utility and Diagnostics Utility installed on the system partition of the hard drive

■ ASR-2 configured to load Compaq Utilities after restart

You can also run Compaq Utilities remotely over an IPX or IP network using the Network feature:

■ To use Compaq Utilities on an IPX network, you must have Compaq Insight Manager 2.0 or later or an NVT (Novell Virtual Terminal) Terminal Emulator with VT100 or ANSI terminal capabilities.

■ To use Compaq Utilities on an IP network, you must have Compaq Insight Manager 2.10 or later, or a Telnet Terminal Emulator with VT100 or ANSI capabilities.

If you are notified that ASR-2 restarted the server and you have restarted to Compaq Utilities, use the Inspect Utility or Compaq Insight Manager to view the critical error in the Critical Error Log. Run Diagnostics to diagnose and resolve the problem.

You can configure ASR-2 to restart the server into Compaq Utilities to diagnose the critical error, or to start the operating system to return the server to operational status as rapidly as possible.

When you enable ASR-2 to start the operating system, the server tries to start from the primary partition. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access Compaq Utilities.

When you enable ASR-2 to start Compaq Utilities, your server restarts after a critical error and loads Compaq Utilities from the system partition on the hard drive.

You can configure your server to start Compaq Utilities in four different ways:

■ Without remote console support; for example, to run Compaq Utilities from the server console only

■ With remote console support using modems for dial-in access

■ With remote console support using a modem to dial a predetermined telephone number

■ With remote console support through a network connection (IP or IPX)

Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities. Some of the console's features include

■ Accessible using ANSI terminal

■ Operates independently of the operating system

■ Provides for remote server reboot

■ Provides access to system configuration

■ Uses out-of-band communication with dedicated management modem installed in the server

For more information, see the *Integrated Remote Console User Guide,* that shipped with your server.

> **IMPORTANT:** Before configuring ASR-2, verify that the System Configuration Utility and Diagnostics software are installed on the system partition. ASR-2 must have this to start Compaq Utilities after a system restart. Compaq recommends this even if you configure ASR-2 to start the operating system.

Compaq Health Driver

The Compaq Health Driver continually resets the ASR-2 timer according to the frequency you specified in the System Configuration Utility (for example, 10 minutes). If the ASR-2 timer counts down to zero before being reset, due to an operating system crash or a server lock-up, ASR-2 restarts the server into either Compaq Utilities or the operating system (as indicated by the System Configuration parameters). The default value is 10 minutes. The allowable settings are 5, 10, 20, and 30 minutes.

For remote and off-site (unattended) servers, setting the software error recovery time-out for 5 minutes reduces the server downtime and allows the server to recover quickly. For local (attended) servers located onsite, you can set the software error recovery time-out for 20 or 30 minutes, giving you time to arrive at the server if you wish to manually diagnose the problem.

The Compaq Health Driver is independent of the ASR-2 timer. You should load it enabling the ASR-2 timer. This allows the driver to detect and log information about numerous hardware and software errors in the IML. However, you cannot enable the ASR-2 timer without loading the Compaq Health Driver.

Before ASR-2 restarts the server, it will record any information available about the condition of the operating system in the Critical Error Log, or the IML depending on the server support. This information can be used to diagnose an operating system crash or server lock-up, while still allowing the server to be restarted.

The following ASR-2 flow chart shows you the sequence of events after a hardware or software error occurs:

```
                    ┌─────────────────────────────────────┐
                    │   Hardware/Software error occurs     │
                    └─────────────────────────────────────┘
                                      │
                    ┌─────────────────────────────────────┐
                    │  Error records in the Critical Error │
                    │  Log, or the Integrated Management    │
                    │  Log, depending on your server        │
                    │  configuration.                       │
                    └─────────────────────────────────────┘
                                      │
                    ┌─────────────────────────────────────┐
                    │   Operating System halts normal       │
                    │   operation                           │
                    └─────────────────────────────────────┘
                                      │
                    ┌─────────────────────────────────────┐
                    │   ASR Timer expires                   │
                    └─────────────────────────────────────┘
                                      │
                    ┌─────────────────────────────────────┐
                    │   Server is reset                     │
                    └─────────────────────────────────────┘
                                      │
                    ┌─────────────────────────────────────┐
                    │  If a modem is installed and paging   │
                    │  is enabled, the Server Failure       │
                    │  Notification pager alert is sent to  │
                    │  the Server Administrator             │
                    └─────────────────────────────────────┘
```

Unattended server boots the Operating System	---Or---	Server boots the Compaq Utilities on the system partition on the hard drive

If the server continues experiencing hardware/software errors and the number of ASR cycles exceed the specified number of recovery attempts, the server will log an error to the Server Health Log or the Integrated Management Log and boot the Compaq Utilities from the system partition on the hard drive	If a modem is installed, ASR puts the modem on auto answer so that the Server Administrator can dial in using third party terminal emulator software to remotely run the Compaq Utilities to identify the source of the fault

Or

Local Server Administrator runs Compaq Utilities from server console to identify the source of the fault

Figure 3-1. ASR-2 flow chart

Booting into Compaq Utilities

When you enable ASR-2 to start into Compaq Utilities and a critical error occurs, the operating-system-specific Health Driver logs the error information in the Critical Error Log or the IML and the ASR-2 feature restarts the server. When the system reinitializes, the system pages the designated administrator (if enabled), and starts Compaq Utilities from the hard drive.

If Dial-In status is enabled, the modem is placed in auto-answer mode. If you enable Dial-Out status, you are automatically enabled for Dial-In.

If Network Status is enabled, the appropriate network support software is loaded, depending on the network protocol, IP or IPX. This allows remote access via the network.

> **IMPORTANT:** Compaq Utilities are loaded from a specially created system partition on the hard drive. This partition was configured during server configuration.

You can access the server and view the Server Health Logs (in servers not supporting the IML) remotely by modem, in-band over the network, or directly from the server. For modem access, you must have either Compaq Insight Manager 2.0 or above or have a VT100 or ANSI terminal type device. You may use a standard CRT with VT100 or ANSI emulation capability, or you may use a PC with a VT100 or ANSI terminal emulation package. The communication parameters must be set for 8 data bits, no parity, and 1 stop bit.

You can also enable ASR-2 to allow network access using the Network Status feature in the System Configuration Utility. You must have either Compaq Insight Manager 2.0 or greater or a Novell Virtual Terminal (NVT) emulator on an IPX network to use this feature. You must also have version 2.24 or later of the System Configuration Utility. For IP access, you must have either Compaq Insight Manager 2.10 or later, or a Telnet Terminal emulator to use this feature. You also must have version 2.24 or later of the System Configuration Utility.

The System Configuration Utility settings should resemble the settings in the following table when you enable ASR-2 to start into Compaq Utilities.

Table 3-23
Compaq System Configuration Utility Pager Settings
for Booting into Compaq Utilities

Pager Data	Setting	Description
Pager status	Enabled	Indicates if the pager feature is enabled or disabled.
Pager dial string	ATDT 555-5555	Indicates the pager dial string and delay before the pager message. Pagers typically use one of the following formats: Local pagers: ATDT 555-5555 Wide area pagers: ATDT 1-800-555-5555,1234567#
Pager message	1234567#	Represents a unique number (maximum seven digits, numeric only) that you must designate to identify the server on your pager display. The ROM adds a three-digit code to the front of this number. The first two indicate the subsystem and the third indicates the severity of the error that caused the alert. The # symbol usually terminates the message. If no message is required, delete the # symbol.
Pager test	Select to test pager setup	Use this to test the current pager settings. Press Enter to dial the pager number, and the pager message (if present) displays. You must configure the computer before testing the pager and the Pager Status must be set to Enabled. Do not test the pager if you are running remotely and are using only one modem.
Serial interface	COM1	Select the communications port for the modem used by the pager and the remote ASR-2 functions. The options are COM1 and COM2.
Dial-in status	Enabled	Set Dial-In Status to Enabled. Be sure the Reset Boot option is set to Boot Compaq Utilities. When the system starts because of an ASR reset, it starts to the Compaq Utilities, sets the Management Modem to auto-answer, and waits for the administrator to dial in and run the Compaq Utilities. You automatically disable this option when you configure the software error recovery start option to Boot Operating System. When ASR pages you, you cannot dial in unless ASR-2 exceeds 10, the threshold number of server restart retries. When this happens, ASR-2 restarts the server into the Compaq Utilities and places the modem in auto-answer mode.

continued

**Compaq System Configuration Utility Pager Settings
for Booting into Compaq Utilities** *continued*

Pager Data	Setting	Description
Dial-out status	Enabled	Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial-In Status is automatically selected. To use the dial-out feature, set Dial-Out Status to Enabled and set the Dial-Out String to the correct phone number. You must also set the Reset Boot option to Boot Compaq Utilities. When the system restarts because of an ASR reset, the administrator is paged via Pager Status and Pager Dial String, the system restarts to the Compaq Utilities, and dials out to the phone number provided in the Dial-Out string. The dial-out number will be tried five times. If it fails to connect after five attempts, the modem is put in auto-answer mode.
Dial-out string	555-1234	Enter the dial string followed by the remote computer telephone number.
Network status	Enabled	To allow network access to Compaq Utilities, set Network Status to Enabled and make sure the Reset Boot option is set to Boot Compaq Utilities.
Network protocol		To use IPX network access, set Network Protocol to IPX. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IPX network support. This enables remote access via NVT. To use IP network access, set Network protocol to IP. Also make sure to set Network IP address, Network IP net mask, and Network IP router address. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IP network support. This enables remote access via Telnet. **NOTE:** The Network Status must be set to Enabled for network access.
Network controller	Compaq	For all Compaq Standard Network Controllers.
Network host name	CPQHOU	Enter the network name of the server. Use underscores instead of spaces within the name, for example, Compaq_Server. If you are using IPX network access to the Compaq Utilities, this server name is used to advertise NVT host services. This server name displays in the Compaq Insight Manager server list when it determines it can communicate via NVT. Set this name to be the same as the server name you assign when the host OS is running.

Network card slot	Slot #	Select the slot number of the network interface card you wish to use for network access to Compaq Utilities.
Network frame type	ETHERNE T_II	Select the frame type for your network. Selections include both Ethernet and Token Ring topologies.

**Compaq System Configuration Utility Pager Settings
for Booting into Compaq Utilities** *continued*

Pager Data	Setting	Description
Network IP address		Enter the IP address for this server in standard dot notation.
		NOTE: This is not used if you select Custom for Network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP net mask		Enter the net mask for this server in standard dot notation.
		NOTE: This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP router address		Enter the router to be used for this server in standard dot notation.
		NOTE: This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.

If you configure the server to boot into Compaq Utilities, it prepares for remote communications. You can remotely run Diagnostics software, Inspect Utility, or System Configuration Utility using a workstation running terminal emulation software, such as Compaq Insight Manager or PC Anywhere.

Booting into the Operating System

When you enable ASR-2 to restart into the operating system and a critical error occurs, ASR-2 logs the error in the Critical Error Log or IML and restarts the server. The system ROM pages the designated administrator, and executes the normal restart process.

> **IMPORTANT:** When you enable ASR-2 to restart into the operating system, Modem Dial-In Status, Network Status, and Modem Dial-Out Status are automatically disabled. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access the server, and the server cannot dial out to a remote workstation.

During the recovery process, the ASR-2 feature tries to restart the server up to 10 times. If the ASR-2 feature cannot restart the server within 10 attempts, it logs a critical error in the Critical Error Log or IML Log restarts the server into the Compaq Utilities, and puts the modem into auto-answer mode.

Your System Configuration Utility setting should resemble the following when you enable ASR to restart into the operating system:

■	Serial interface	COM1
■	Dial-in status	Disabled
■	Dial-out status	Disabled
■	Dial-out string	555-1234
■	Network status	Disabled
■	Network protocol	IPX
■	Network controller	Compaq
■	Network host name	CPQHOU
■	Network card slot	Slot #
■	Network frame type	ETHERNET_II
■	Network IP address	xxx.xxx.xxx.xxx
■	Network IP net mask	xxx.xxx.xxx.xxx
■	Network IP router address	xxx.xxx.xxx.xxx

ASR-2 Security

The standard Compaq password features function differently during ASR-2 than during a typical system startup.

During ASR-2, the system does not prompt for the Power-On Password. This allows the ASR-2 to restart the operating system or Compaq Utilities without user intervention.

To maintain system security, set the server to boot in Network Server Mode (an option in the System Configuration Utility). This option ensures that the server keyboard is locked until you enter the Keyboard Password.

Select an Administrator Password (an option in the System Configuration Utility). During attended ASR-2 (local or remote), you must enter this Administrator Password before any modifications can be made to the server configuration.

Server Health Logs

In some servers, Server Health Logs are replaced by the IML, if it is supported. See "Integrated Management Display" in this chapter for more information.

The Server Health Logs contain information to help identify and correct any server failures and correlate hardware changes with server failure. The Server Health Logs are stored in nonvolatile RAM and consist of the Critical Error Log and the Revision History Table.

If errors occur, information about the errors is automatically stored in the Critical Error Log.

Whenever boards or components (that support revision tracking) are updated to a new revision, the Revision History Table will be updated.

Critical Error Log

The Critical Error Log records memory errors, as well as catastrophic hardware and software errors that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the Critical Error Log through the Compaq Insight Manager. The Diagnostics Utility either resolves the error or suggests corrective action in systems that do not support event logs.

The Critical Error Log identifies and records all the following errors. Each error type is briefly explained below.

Table 3-24
Critical Error Log Messages

Message	Description
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery-2 (ASR-2) timer expiration.
Automatic Server Recovery Extended Memory Parity Error	The system detected a data error in extended memory following a reset due to the ASR-2 timer expiration.
Automatic Server Recovery Memory Parity Error	The system ROM was unable to allocate enough memory to create a stack. Then, it was unable to put a message on the screen or continue booting the server.
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to ASR-2 timer expiration has been reached, resulting in the loading of Compaq Utilities.
Battery Failing	Low system battery warning. Replace battery within 7 days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the system's nonvolatile RAM is imminent.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Diagnostic Error	An error was detected by the Diagnostics Utility. See the specific error code in this chapter for a detailed explanation.

Error Detected On Boot Up	The server detected an error during the Power-On Self-Test (POST).
Processor Prefailure	A CPU has passed an internal corrected error threshold; excessive internal ECC cache errors .

continued

Critical Error Log Messages *continued*

Message	Description
NMI - PCI Bus Parity Error	A parity error was detected on the PCI bus.
NMI - Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a server failure.
NMI - Expansion Bus Master Time-Out	A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure.
NMI - Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure.
NMI - Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a server failure.
Processor Exception	The indicated processor exception occurred.
NMI - Processor Parity Error	The processor detected a data error, resulting in a server failure.
Server Manager Failure	An error occurred with the Server Manager/R.
NMI - Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a server failure.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
NMI- Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR-2 timer expiration.
Required System Fan Failure	The required system fan has failed. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
UPS A/C Line Failure Shutdown or Battery Low	The UPS notified the operating system that the AC power line has failed. Accompanying data indicates if an auto-shutdown sequence has been invoked or if the battery has been nearly depleted.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.

Revision History Table

Some errors can be resolved by reviewing changes to the server configuration. The server has an Automatic Revision Tracking (ART) feature that helps you review recent changes to the server configuration.

One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other system boards providing ART-compatible revision information. This feature lets you determine the level of functionality of an assembly in a system without opening or powering down the unit.

Table 3-25
Revision History Format

Current Revisions	
Data	10/31/95
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A
Previous Revisions	
Date	03
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A

The Revision History Table is stored in nonvolatile RAM and is accessed through Inspect Utility and Compaq Insight Manager.

Storage Fault Recovery Tracking

This feature tracks over 12 failure-indication parameters, such as time-outs, spin-up, and self-test errors of SCSI drives. You can use these parameters to pinpoint failed storage subsystem components and to recover from controller or hard drive failure.

Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure your server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation if a drive fails.

Network Interface Fault Recovery Tracking

This feature tracks over 20 failure indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and Token Ring network interfaces. It decreases network downtime by enabling diagnosis of actual network interface failures.

Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for uncorrectable memory errors.

Remote Service Features

Compaq servers have the following management features that you can access by modem or network:

Table 3-26
Compaq Servers Remote Management Features

Feature	Description
Service Session	Provides remote access to all the utilities on the system partition, including Diagnostics utilities, Inspect, ROMPaq, Drive Array Advanced Diagnostics (DAAD), and the System Configuration Utility. Also provides the capability for remote file transfer services to and from the system partition.
Disk-Based Diagnostics	Provides remote diagnostic capability after you configure ASR-2 and the reset restart option to restart from Compaq Utilities. Also allows you to view Health Logs. Disk-based diagnostics can also be run locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Server Restart	Provides the ability to restart the server remotely from Compaq Insight Manager while the operating system is running. Allows the server to restart back to the operating system or restart to the system partition. Provides a complete system reset to all peripherals. If you select Boot to Compaq Utilities from Compaq Insight Manager, Compaq Utilities loads the appropriate remote services so that remote access is available. If network status is enabled, network support is loaded. If Dial-In status is enabled, the modem is set to auto-answer.
Configuration Utility	Allows you to run the System Configuration Utility remotely. You can also run the remote configuration utility locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Firmware Updates	Allows you to update the server firmware remotely. Uses firmware images on the system partition that might have been previously uploaded with the file transfer services.

ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the ROM:

■ Run the ROMPaq utility from the system partition, or

■ Insert a ROMPaq diskette into drive A and cold boot the system.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

> △ **CAUTION:** Do not turn the power off during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from booting.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your servers.

Features of Compaq Insight Management

Compaq Insight Management features include:

■ Comprehensive Fault Management - For all major subsystems, including pre-failure alerting for disks, memory, and Pentium Pro processors.

■ Integration Management - In conjunction with SmartStart, allows you to effectively deploy and manage configurations throughout the enterprise using the Integration Server and Insight Version Control.

■ Performance Management - Sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more.

■ Workstation Management - Monitors and manages Compaq Professional Workstations.

■ Client Management - Manages faults and assets on Compaq Deskpro computers.

■ Netelligent Management - Receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software.

- Asset Management - Exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications.

- Remote Management - Manages in-band or out-of-band devices, online or offline, from any location.

- Reporting - Using Automatic Data Collection, gathers historic performance information for graphing or export purposes.

- Integration with Enterprise Management Platforms - Provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is typical of other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system's state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers monitoring functions that include temperature sensing and disk pre-failure alerting.

Insight Agents provide information to management applications such as Compaq Insight Manager, and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol or SNMP.

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the Systems Reference Library CD that accompanied your server.

Chapter 4
Connectors, Switches, and Jumpers

This chapter provides connector, switch, and jumper information for the Compaq ProLiant 1850R Servers.

System Board

The Compaq ProLiant 1850R Server system boards contain the system maintenance switchbank and the external battery jumper.

Switch SW1 - System Maintenance Switchbank

Switch SW1 is a six-position switchbank (S1-S6) that controls the security features and maintenance of the computer.
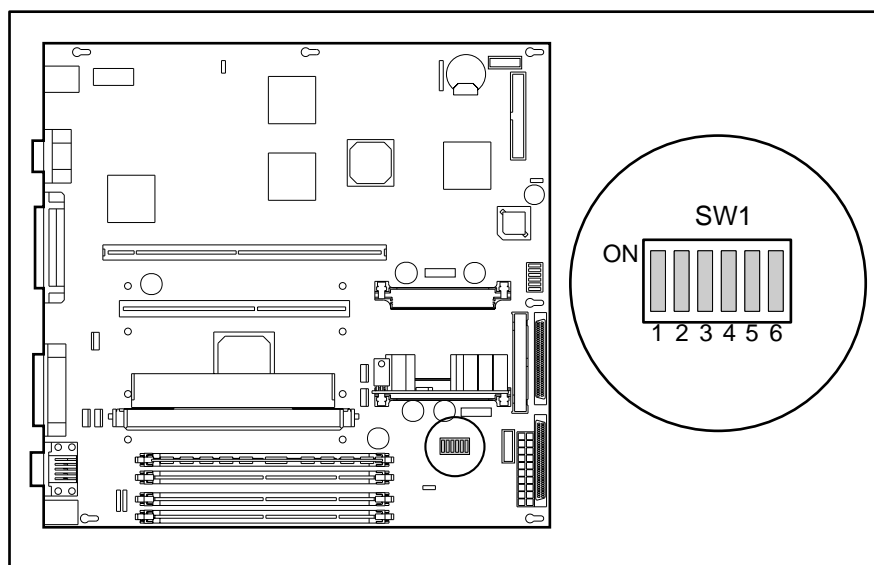
Figure 4-1. Location of the system board switch SW1

The following table defines the function for each switch setting of SW1. The default positions are indicated below.

> △ **CAUTION:** Setting the processor switchbanks incorrectly can result in permanent damage to the processor and/or data loss.

Table 4-1
System Maintenance Switch Settings - SW1

Switch	Function	Set to ON	Set to OFF
1	Video Disable Override	Disable Embedded Video Always	ROM auto-detects for an optional video card. If one is not found, then the onboard video is enabled.
2	Lock Configuration	Locks system configuration	Allows configuration to be changed.
3	Rack Mount	* Rack Mount Configuration	Tower Configuration
4	Diskette Override	Overrides configuration and allows booting from diskette	* Booting from diskette is controlled by the configuration.
5	Power-ON Password	Power-ON password is disabled.	* Power-ON password is enabled (through system configuration).
6	Maintenance	Places server in maintenance mode for testing.	* Places server in normal mode.

 * Must be set as shown for the server to operate correctly.

SCSI Devices

No two SCSI devices connected to the same SCSI controller can have the same SCSI ID. If another SCSI device is connected to the same controller, check its SCSI ID in the Compaq System Configuration Utility before beginning installation procedures for an additional drive (see Chapter 3).   The SCSI ID is set by jumpers ID 2, ID 1, and ID 0 located on each SCSI device.

The following chart provides the SCSI ID jumper settings for Compaq SCSI hard drives.

Table 4-2
SCSI ID Settings

SCSI ID	Bit 2	Bit 1	Bit 0
6	ON	ON	OFF
5	ON	OFF	ON
4	ON	OFF	OFF
3	OFF	ON	ON
2	OFF	ON	OFF
1	OFF	OFF	ON
0	OFF	OFF	OFF

Rear Panel Connectors

The Compaq ProLiant 1850R rear panel connectors are illustrated below. See Table 4-3 for connector names.
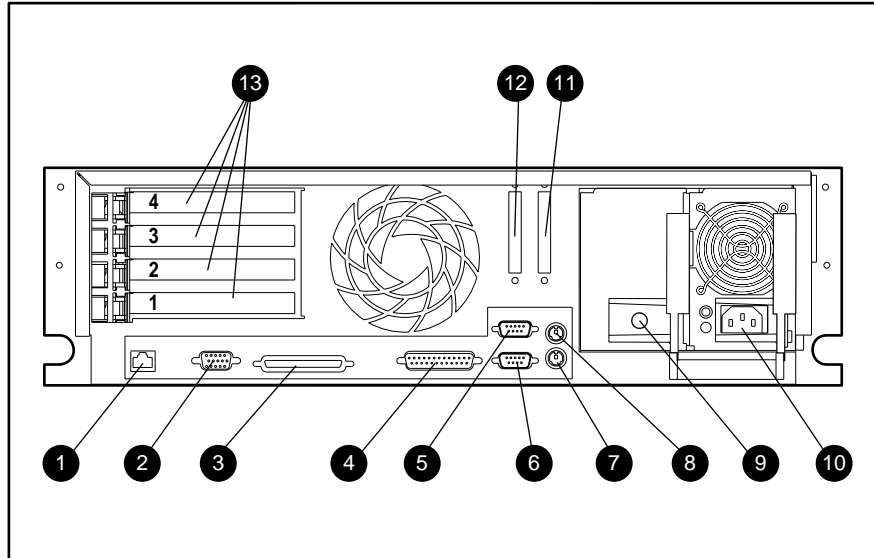
Figure 4-2. Rear panel connectors

Table 4-3
Rear Panel Connectors

Reference	Connector
1	RJ-45 Network
2	Video
3	External fast SCSI-2 connector, channel B
4	Parallel/printer port
5	Serial B (COM 2)
6	Serial A (COM 1)
7	Keyboard
8	Mouse
9	Optional hot-pluggable redundant power supply
:	Standard hot-pluggable power supply
;	External SCSI port
<	External SCSI port
=	Expansion slots (1-4)

Riser Board Expansion Slots

The Compaq ProLiant 1850R riser board has four expansion slots which are illustrated below. See Figure 4-3 and Table 4-4 for expansion slot locations and description.
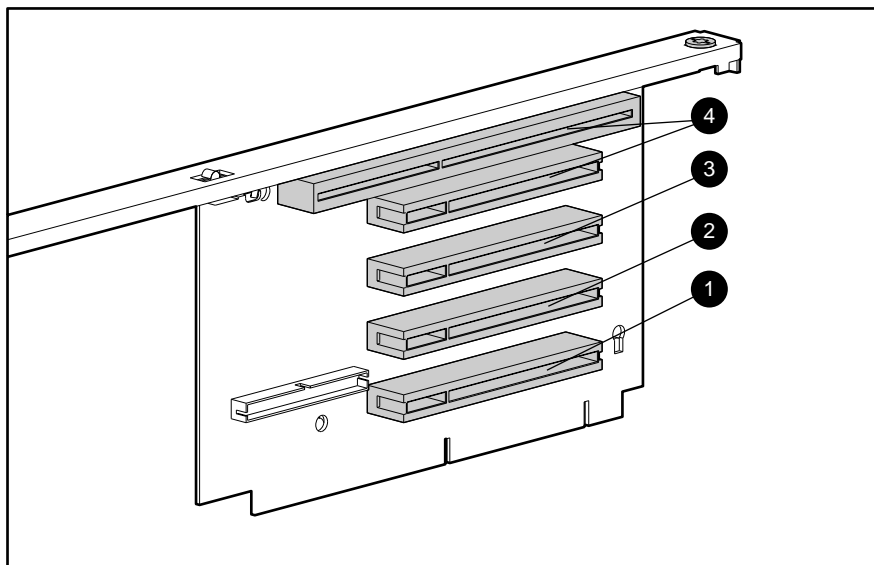
Figure 4-3. ProLiant 1850R expansion slots

Table 4-4
Riser Board Expansion Slot Description

Slot #	Description
4	PCI/ISA Slot
3	PCI Slot
2	PCI Slot
1	PCI Slot

Chapter 5
Physical and Operating Specifications

This section provides operating and performance specifications for Compaq ProLiant 1850R Servers and optional hardware.

■   System Unit

■   Power Supply

■   Memory

■   Diskette Drive

■   IDE CD-ROM Drives

■   Hard Drives

System Unit

Table 5-1
Compaq ProLiant 1850R Servers System Unit Specifications

	U.S.	International
Dimensions		
Height	5.2 in	13.1 cm
Depth	22.1 in	56.2 cm
Width	17.7 in	45.00 cm
Weight		
Fully Configured	35 lb.	15.9 kg
Input Requirements		
Rated Input Voltage	100-120 VAC	220-250 VAC
Rated Input Frequency	50-60 Hz	50-60 Hz
Rated Input Current	4.6 A	3.0 A
Power Supply Output Power		
Rated Stead-State Power	225 W	225 W
Maximum Peak Power	250 W	250 W
BTUs	1450 Btu/h	1450 Btu/h
Temperature Range		
Operating	50°-95 °F	10° -35°C
Non-operating	-22°-122 °F	-30° -50°C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7 °F	38.7°C

Hot-Plug Power Supply

Table 5-2
Hot-Plug Power Supply Specifications

	U.S	International
Input Specifications		
Nominal Line Voltage	100 to 120 VAC	220 to 250 VAC
Range Input Line	90 to 132 VAC	180 to 264 VAC
Frequency Range	47 to 63 Hz	47 to 63 Hz
Power Factor	0.95	0.85
Input Power	410 W	410 W
Input Current Requirement		
Maximum steady state	<4.6 A rms	<3 A rms
Inrush Current		
Cold start	<80 A	<80 A
Hot start	<80 A	<80 A
Holdup Time	20 ms from zero crossing at 120 VAC	20 ms from zero crossing at 240 VAC
General Specifications		
Full Output Rating	To 50°C and 5,000 ft	To 122°F and 1.5m
	To 32°C and 10,000 ft (derate linearly)	To 90°F and 3.4m
Minimum Load	0.0 A on +12 V output 0.0 A on +3.5 V output 0.0 A on +12 V output 0.0 A on +5 V output 0.0 A on -12 V output 1.0 A on -5 V output	0.0 A on +12 V output 0.0 A on +3.5 V output 0.0 A on +12 V output 0.0 A on +5 V output 0.0 A on -12 V output 1.0 A on -5 V output
Ambient Temperature Range		
Operating	41°F to 122°F	5°C to 50°C
Non-Operating	-40°F to 185°F	-40°C to 85°C

continued

Power Supply Specifications *continued*

	U.S	International
Dielectric Voltage Withstand		
Input to Output	3000 VAC/min.	3000 VAC/min.
Input to Ground	1500 VAC/min.	1500 VAC/min
Safety Standard	UL 1950; CSA 22.2 #950 or CSA 22.2 #234; TUV/VDE EN 60 950 (VDE0805/11.91); EMKO-TSE 207/94; NOM-019-SCFI	
EMI	3 dB below CISPR Publication 22 Class B; 6 dB below BMPT - AmtsblVfg 243/1991 limits; 6 dB below CFR 47, Part 15 Class B limits.	
Input Transient Protection	Complies with conditions as defined in the following specifications: IEC801-4 or IEC801-5.	

Memory

Table 5-3
Synchronous DRAM (SDRAM) Dual Inline Memory Module (DIMM) Specifications

Size	32, 64, 128, 256-MB
Speed	100 MHz
Width	72 bits
Upgrade Requirement	Any combination of SDRAM DIMM with minimum of 64 MB total memory required

NOTE: Use only 32-, 64-, 128-, 256-MB, registered, 72-bit wide, 4-K refreshed, 3.3-volt, ECC SDRAM. SDRAM must be 100 MHz or faster. Use Compaq SDRAM only.

1.44-MB Diskette Drive

Table 5-4
1.44-MB Diskette Drive Specifications

Size	3 1/2 in
LED Indicators (front panel)	Green
Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB
Drive Supported	One
Drive Height	One-third
Drive Rotation	300 rpm
Transfer Rate bits/sec (high/low)	500 K/250 K
Bytes/Sector	512
Sectors/Track (high/low)	18/9
Tracks/Side (high/low)	80/80
Access Times	
Track-to-Track (high/low)	3 ms/6 ms
Average (high/low)	169 ms/94 ms
Settling Time	15 ms
Latency Average	100 ms
Cylinders (high/low)	80/80
Read/Write Heads	Two

Low-Profile 24X Max IDE CD-ROM Drive

**Table 5-5
Low-Profile 24X Max IDE CD-ROM Drive Specifications**

	U.S.	International
Applicable Disk	CD-ROM (Mode 1 and 2); CD-XA (Mode 2, Form 1 and 2); CD-1 (Mode 2, Form 1 and 2); CD-1 Ready; CD-Bridge; PhotoCD (Single and Multi Session); CD-WO (Fixed packets only)	
Capacity	550 MB (Mode 1, 12 cm); 640 MB (Mode 2, 12 cm); 180 MB (8 cm)	
Block Size	2638, 2352 bytes (Mode 0); 2352, 2340, 2336, 1024 bytes (Mode 1); 2352, 2340, 2336, 2048, 1024 bytes (Mode 2)	
Dimensions	U.S.	International
Height	0.5 in	12.7 mm
Depth	5.12 in	130 mm
Width	5.16 in	131 mm
Weight	< 12.35 oz	< 350 g
Data Transfer Rate		
Sustained	1200 KB/s	
Burst	8.3 MB/s	
Access Times (typical)		
Full Stroke	< 600 ms	
Random, 8X speed	< 275 ms	
Disk		
Diameter	4.7 in, 3.15 in	12 cm, 8 cm
Rotational speed	1840 to 4240 rpm	
Center Hole (diameter)	.6 in	15 mm
Thickness	.05 in	1.2 mm
Track pitch	1.6 μm	

continued

Low-Profile 24X Max IDE CD-ROM Drive Specifications *continued*

	U.S.	International
Interface	IDE	
Cache/Buffer	256 KB	
Audio Output Level, Line Out	0.7 VRMS at 47 kΩ	
Cache buffer	256 KB	
Startup Time	<10 seconds	
Stop Time	5 seconds	
Laser Parameters		
Type	Semiconductor Laser GaAIAs	
Wave Length	780 nm +/- 35 nm	
Divergence Angle	53.5 degrees +/- 1.5 degrees	
Output Power	0.13 mW	
Operating Conditions	U.S.	International
Temperature	41° to 113°F	5° to 45°C
Humidity	10% - 80%	

4.3-GB Wide-Ultra SCSI-3 Hard Drive

Table 5-6
4.3-Gigabyte Wide-Ultra SCSI Drive Specifications

Capacity	4293.6 MB	
Height	Third, 1 inch	
Size	3.5 inch	
Interface	Wide-Ultra SCSI-3	
Transfer Rate	40 MB/s	
Sector Interleave	1:1	

Seek Times (typical, including settling)
  Single Track
  Average
  Full Stroke
	
	1.0 ms
	7.9 ms
	19.0 ms	

Rotational Speed	7200 rpm	
Cylinders	4,811	
Heads	11	
Sectors/Track	126 to 207	
Bytes Sector	512	
Logical Blocks	8,386,000	
Operating Temperature	U.S.	International
	50° to 86° F	10° to 30° C

Inde x